



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

International clinics

BOSTON
MEDICAL LIBRARY
8 THE FENWAY

INTERNATIONAL CLINICS:

A QUARTERLY OF CLINICAL LECTURES

ON

MEDICINE, NEUROLOGY, SURGERY, GYNÆCOLOGY,
OBSTETRICS, OPHTHALMOLOGY,
LARYNGOLOGY, PHARYNGOLOGY, RHINOLOGY,
OTOLOGY, AND DERMATOLOGY,

AND SPECIALLY PREPARED ARTICLES ON TREATMENT.

BY PROFESSORS AND LECTURERS IN THE LEADING
MEDICAL COLLEGES OF THE UNITED STATES,
GERMANY, AUSTRIA, FRANCE, GREAT
BRITAIN, AND CANADA.

EDITED BY

JUDSON DALAND, M.D. (UNIV. OF PENNA.), PHILADELPHIA,
Instructor in Clinical Medicine and Lecturer on Physical Diagnosis in the University of Pennsylvania;
Assistant Physician to the Hospital of the University of Pennsylvania; Professor of
Diseases of the Chest in the Philadelphia Polyclinic; Fellow of the
College of Physicians of Philadelphia.

J. MITCHELL BRUCE, M.D., F.R.C.P., LONDON, ENGLAND,
Physician to and Lecturer on the Principles and Practice of Medicine in the Charing Cross Hospital.

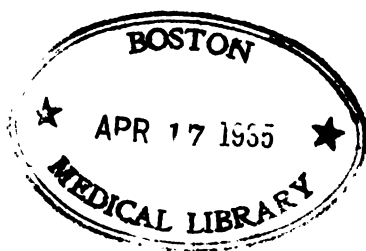
DAVID W. FINLAY, M.D., F.R.C.P., ABERDEEN, SCOTLAND,
Professor of Practice of Medicine in the University of Aberdeen; Physician to and Lecturer on Clinical
Medicine in the Aberdeen Royal Infirmary; Consulting Physician to the Royal
Hospital for Diseases of the Chest, London.

VOLUME II. SIXTH SERIES. 1896.

PHILADELPHIA:
J. B. LIPPINCOTT COMPANY.
1896.



Copyright, 1896, by J. B. LIPPINCOTT COMPANY.



PRINTED BY J. B. LIPPINCOTT COMPANY, PHILADELPHIA, U.S.A.

CONTRIBUTORS TO VOLUME II.

(SIXTH SERIES.)

Ashby, T. A., M.D., Professor of Diseases of Women and Children in the Baltimore Medical College.

Baumgarten, G., M.D., Professor of the Practice of Medicine in the St. Louis Medical College, Washington University.

Bernays, A. C., A.M., M.D. (Heidelberg), **M.R.C.S.** (Edin.), Professor of Anatomy and Clinical Surgery at the Marion-Sims College of Medicine, St. Louis, Mo.; Life Member of the German Society of Surgeons; Secretary, Surgical Section, Tenth International Congress, Berlin, etc.

Bevan, Arthur Dean, M.D., Professor of Anatomy in Rush Medical College; Professor of Surgery in the Women's Medical School; Surgeon to St. Luke's, the Presbyterian, and St. Elizabeth's Hospitals, Chicago.

Binz, Professor C., M.D., of Bonn.

Cantrell, J. Abbott, M.D., Professor of Diseases of the Skin in the Philadelphia Polyclinic and College for Graduates in Medicine; Dermatologist to the Philadelphia Hospital and to the Southern Dispensary, Philadelphia.

Cattell, Henry W., A.M., M.D., Demonstrator of Morbid Anatomy in the University of Pennsylvania; Pathologist to the Presbyterian Hospital, etc.

Colburn, J. Elliott, M.D., Professor of Ophthalmology in the Chicago Polyclinic.

Cuffer, M., M.D., Physician to the Necker Hospital, etc., Paris, France.

Cumston, Charles Greene, B.M.S., M.D., Assistant Professor of Surgical Pathology in Tufts College; Member of the Société Française d'Électrothérapie; Corresponding Fellow of the Maine Academy of Medicine and Science; Director of the Gynecological Clinic, Tremont Dispensary, etc.

Dabney, Samuel G., M.D., Professor of Physiology and Clinical Lecturer on Diseases of the Eye, Ear, Nose, and Throat in the Hospital College of Medicine, etc., Louisville, Ky.

Daland, Judson, M.D., Lecturer on Physical Diagnosis and Instructor in Clinical Medicine in the University of Pennsylvania; Assistant Physician to the Hospital of the University of Pennsylvania; Professor of Diseases of the Chest in the Philadelphia Polyclinic; Fellow of the College of Physicians of Philadelphia, etc.

De Garmo, William Burton, M.D., Professor of Special Surgery (Hernia) in the New York Post-Graduate Medical School and Hospital.

Packler, George A., M.D., Director of the Laboratory for Experimental Pharmacology at the Laura Memorial Medical College, and Clinical Lecturer on Internal Medicine at the Cincinnati Hospital, Cincinnati, Ohio.

Pournier, Professor, M.D., Clinical Professor of Diseases of the Skin and of Syphilography in the Faculty of Medicine; Visiting Physician to the Hospital Saint-Louis, Paris, France.

Frank, Louis, M.D., Associate Professor of Obstetrics and Director in the Bacteriological Laboratory in the Kentucky School of Medicine; Gynecologist to the Louisville City Hospital and the Kentucky School of Medicine Hospital, etc., Louisville, Ky.

Gaston, J. McFadden, M.D., Professor of the Principles and Practice of Surgery in the Southern Medical College, etc., Atlanta, Ga.

Gibson, G. A., M.D., D.Sc., F.R.C.P. (Edin.), Assistant Physician to the Royal Infirmary; Physician to the Deaconess Hospital; Lecturer on Medicine at Minto House, Edinburgh.

Godlee, Rickman John, M.S., F.R.C.S., Surgeon to University College Hospital, London.

Grancher, Professor, M.D., Clinical Professor of Diseases of Children in the Paris Faculty of Medicine, France.

Greene, Charles L., M.D., Instructor in Physical Diagnosis and Clinical Medicine in the University of Minnesota; Visiting Physician to the City and County Hospital, University Free Dispensary, etc., St. Paul, Minn.

Haward, Warrington, F.R.C.S. (Eng.), Surgeon to and Lecturer on Clinical Surgery at St. George's Hospital, London, England.

James, Alexander, M.D., F.R.C.P.E., Physician to the Edinburgh Royal Infirmary; and Lecturer on the Practice of Medicine in the Edinburgh Medical School.

Lloyd, James Hendrie, A.M., M.D., Physician to the Nervous Department of the Philadelphia Hospital, to the Methodist Episcopal Hospital, and to the Home for Crippled Children; Consulting Neurologist to the Elwyn Institute for Feeble-Minded Children.

Milligan, W., M.D., Hon. Surgeon, Manchester Ear Institution; Lecturer upon Diseases of the Ear, the Owens College; Hon. Assistant Physician to the Manchester Throat Hospital.

Muench, Albert, Ph.G., M.D., Lecturer on Pharmacology, Assistant to the Chair of Materia Medica and Therapeutics, Assistant to the Chair of Genito-Urinary Surgery and Diseases of the Skin, in the Kentucky School of Medicine; Consultant Dermatologist to the Louisville City Hospital and the Children's Free Hospital; President of the Falls City Medical Society; Member of the Louisville Academy of Medicine, Louisville, Ky., etc.

Mundé, Paul F., M.D., Professor of Gynecology in the New York Polyclinic; Gynecologist to Mount Sinai Hospital; Consulting Gynecologist to St. Elizabeth's Hospital.

Park, Roswell, A.M., M.D., Professor of Surgery in the University of Buffalo, New York, etc.

Parkhill, Clayton, M.D., Professor of the Principles and Practice of Surgery and of Clinical Surgery in the Medical Department of the University of Colorado.

Penrose, Charles B., M.D., Ph.D., Professor of Gynecology in the University of Pennsylvania.

Potain, Professor, M.D., Professor of Clinical Medicine in the Paris Faculty; Physician to the Charité Hospital, and Member of the Academy of Medicine of Paris.

Ralfe, Charles Henry, M.A., M.D. (Cantab.), F.R.C.P. (Lond.), Physician to the London Hospital, etc.

Shaw, John C., M.D., Professor of Diseases of the Mind and Nervous System in the Long Island College Hospital; Consulting Neurologist to the Long Island College Hospital, St. Catharine's, St. John's, King's County Hospitals, and King's County Insane Asylum, etc.

Stelwagon, Henry W., M.D., Clinical Professor of Dermatology in Jefferson Medical College, Philadelphia.

Stockton, Charles G., M.D., Professor of Medicine in the Medical Department of the University of Buffalo, New York; and Physician to the Buffalo General Hospital.

Tarnier, Professor, M.D., Clinical Professor of Obstetrics in the Faculty of Medicine; Visiting Physician to the Maternity Hospital, etc., Paris, France.

Van Harlingen, Arthur, M.D., Emeritus Professor of Diseases of the Skin in the Philadelphia Polyclinic.

Warner, Francis, M.D. (Lond.), F.R.C.P., Physician to and Lecturer on Clinical Medicine and Therapeutics in the London Hospital, England.

White, W. Hale, M.D., Physician to Guy's Hospital, London, England.

Whittaker, James T., M.D., LL.D., Professor of the Theory and Practice of Medicine in the Medical College of Ohio; Lecturer on Clinical Medicine in the Good Samaritan Hospital, Cincinnati, etc.

Wilder, William H., M.D., Professor of Ophthalmology in the Chicago Polyclinic; Pathologist and Assistant Surgeon of the Illinois Eye and Ear Infirmary; Fellow of the Chicago Academy of Medicine; Member of the American Ophthalmological Society, etc.

Wilson, Frank C., M.D., Professor of Diseases of the Chest and Physical Diagnosis in the Hospital College of Medicine; Fellow of the Louisville Medico-Chirurgical Society, etc., Louisville, Ky.

Yeo, I. Burney, M.D., F.R.C.P., Physician to King's College Hospital, London.

CONTENTS OF VOLUME II.

(SIXTH SERIES.)

Treatment.

	PAGE
THE DIAGNOSTIC VALUE OF RÖNTGEN'S DISCOVERY. By HENRY W. CATTELL, A.M., M.D.	1
THE TREATMENT OF MALARIA. By JUDSON DALAND, M.D. . . .	8
THE TREATMENT OF WHOOPING-COUGH WITH QUININE. By PROFESSOR C. BINZ, M.D.	16
THE ANALEPTICS: HEAT; ELECTRICITY; CAFFEINE; NITRO-GLYCERIN; AMYL NITRITE; MORPHINE; ATROPINE; COCAINE; AND CAMPHOR. By JAMES T. WHITTAKER, M.D., LL.D.	28
REST, EXERCISE, AND BATHS IN THE TREATMENT OF CARDIAC AFFECTIONS. By I. BURNET YEO, M.D., F.R.C.P. . .	31
THE SURGICAL TREATMENT OF HERNIA. By WILLIAM BURTON DE GARMO, M.D.	48
THE TREATMENT OF ANEURISM OF THE AORTA. By G. A. GIBSON, M.D., D.Sc., F.R.C.P. (Edin.)	49
THE TREATMENT OF GONORRHOEA. By ALBERT MUENCH, Ph.G., M.D.	57
EXTREME DILATATION OF THE HEART DUE TO VALVULAR DISEASE, WITH SPECIAL REFERENCE TO TREATMENT BY THE SCHOTT METHOD. By CHARLES L. GREENE, M.D. . .	68
THE TREATMENT OF ECZEMA. By J. ABBOTT CANTRELL, M.D. .	74
THE TREATMENT OF RETRO-DISPLACEMENTS OF THE UTERUS. By T. A. ASHBY, M.D.	81

Medicine.

ACUTE GENERAL PERITONITIS, TOGETHER WITH REMARKS ON THE ADVISABILITY OF OPERATION FOR INFLAMMATORY CONDITIONS ARISING IN CONNECTION WITH THE VERMIFORM APPENDIX. By W. HALE WHITE, M.D.	89
LATENT ANEURISM OF THE AORTA; THE DIFFERENT FORMS OF ANGINA PECTORIS. By PROFESSOR POTAIN, M.D. .	97

	PAGE
HEMORRHAGIC PANCREATITIS. By ALEXANDER JAMES, M.D., F.R.C.P.E.	106
HYDRO-PNEUMOTHORAX. By CHARLES G. STOCKTON, M.D.	114
THE SPONTANEOUS RELIEF OF ASCITES. By CHARLES HENRY RALFE, M.A., M.D. (Cantab.), F.R.C.P. (Lond.)	118
VARIATIONS IN THE CLINICAL COURSE OF CROUPOUS PNEUMONIA. By G. BAUMGARTEN, M.D.	124
PLEURITIC EFFUSION; HYDROTHORAX; LOBAR PNEUMO- NIA. By GEORGE A. FACKLER, M.D.	184
THE DIFFERENTIATION OF HEART MURMURS. By FRANK C. WILSON, M.D.	145

Neurology.

THE SIGNS TO OBSERVE IN BRAIN DISORDER IN CHILDREN. By FRANCIS WARNER, M.D. (Lond.), F.R.C.P.	154
ARTHROPATHIES AND TROPHIC LESIONS IN LOCOMOTOR ATAXIA. By JAMES HENDRIE LLOYD, A.M., M.D.	160
PARANOIA. By JOHN C. SHAW, M.D.	174

Surgery.

COLLES'S LAW IN SYPHILIS. By PROFESSOR FOURNIER, M.D.	185
CALCULOUS PYELITIS, MULTIPLE RENAL ABSCESS, NE- PHRECTOMY. By ROSWELL PARK, A.M., M.D.	191
IRREDUCIBLE HERNIA. By WARRINGTON HAWARD, F.R.C.S. (Eng.)	196
AMPUTATION OF THE LEG FOR GANGRENE OF THE FOOT AND ANKLE. By J. MCFADDEN GASTON, M.D.	206
TYPHLITIS, PERITYPHLITIS, APPENDICITIS, AND PERIAP- PENDICITIS. By M. CUFFER, M.D.	218
CHRONIC POSTERIOR URETHRITIS; CIRCUMCISION. By AL- BERT MUENCH, Ph.G., M.D.	220
FEMORAL HERNIA; FRACTURE OF THE NECK OF THE RIGHT FEMUR. By ARTHUR DEAN BEVAN, M.D.	225
SURGICAL TECHNIQUE. By CLAYTON PARKHILL, M.D., Denver, Colorado	280
FIVE CASES OF SECONDARY SYPHILIS. By LOUIS FRANK, M.D.	284
TWO CASES OF PRIMARY NEPHRECTOMY IN WOUNDS OF THE KIDNEY. By A. C. BERNAYS, A.M., M.D. (Heidelberg), M.R.C.S. (Eng.)	240
THE OPERATIVE TREATMENT OF APPENDICITIS IN CHILDREN. By PROFESSOR GRANCHER, M.D.	247

Gynæcology and Obstetrics.

	PAGE
CANCER OF THE CERVIX UTERI. By CHARLES B. PENROSE, M.D., Ph.D.	262
HYDATIFORM MOLES. By PROFESSOR TARNIER, M.D.	264
TORSION OF THE PEDICLE IN OVARIAN TUMORS. By CHARLES GREENE CUMSTON, B.M.S., M.D.	270
STERILITY FROM PERI-OÖPHOR-SALPINGITIS; PAIN AFTER OVARIOCTOMY; VAGINITIS; PREGNANCY DURING LAC- TATION. By PAUL F. MUNDÉ, M.D.	286

Ophthalmology.

OPTIC NEURITIS. By WILLIAM H. WILDER, M.D.	290
TRACHOMA CASES. By J. ELLIOTT COLBURN, M.D.	300

Laryngology, Pharyngology, Rhinology, and Otology.

TWO CASES OF DISEASE OF THE MIDDLE EAR, WITH RE- MARKS ON THE ANATOMY OF THE MASTOID ANTRUM. By RICKMAN JOHN GODLEE, M.S., F.R.C.S.	306
ADENOID GROWTHS OF THE NASO-PHARYNX; CHRONIC FOLLICULAR TONSILLITIS. By SAMUEL G. DABNEY, M.D. . .	318
NASO-PHARYNGEAL ADENOID VEGETATIONS AND THEIR RELATION TO MORBID AFFECTIONS OF THE EAR. By W. MILLIGAN, M.D.	326

Dermatology.

HÆMATHIDROSIS (BLOODY SWEAT). By ARTHUR VAN HAR- LINGEN, M.D.	332
LUPUS. By HENRY W. STELWAGON, M.D.	341

LIST OF ILLUSTRATIONS TO VOLUME II.

(SIXTH SERIES.)

PLATES.

	PAGE
Skiagraph of the normal skull, showing the outlines of the nasal bones and the fillings in the teeth (Plate I.) (opposite)	1
Skiagraph of the normal trunk, showing well the articulation of the shoulder-joint (Plate II.) (opposite)	1
Skiagraph of the normal male pelvis (Plate III.) (opposite)	2
Bullets embedded in the lower portion of the middle metacarpal bone. The skiagraph was taken through the bandages (Plate IV.) (opposite)	2
A number of physical objects, such as pins in a pin-cushion, key in a pocket-book, Indian arrow-head, coin, wheel, etc., photographed by the X-rays through eight thicknesses of ordinary mackintosh (reduced) (Plate V.) (opposite)	4
Skiagraph of an articulated skeleton of the hand (Plate VI.) . . . (opposite)	4
Skiagraph of the normal left hand and wrist of an adult, showing sesamoid bone in the thumb (Plate VII.) (opposite)	6
A case of acromegaly, with hyperostosis of the phalanges; a ring on the little finger is well shown (Plate VIII.) (opposite)	6
Skiagraph of a dilated and hypertrophied heart, with calcification of the aortic and mitral leaflets (Plate IX.) (opposite)	7
A series of photographs illustrating the various movements to be performed in carrying out the Schott method of treatment of cardiac disease (Figs. 1 to 20 inclusive) (opposite)	68-73
Photograph of a case of primary nephrectomy for gunshot wound of the kidney (Fig. 1) (opposite)	240
Normal visual fields for white, blue, red, and green of the right eye, as contrasted with the same fields of vision in a case of optic neuritis (Figs. 1, 2) (colored plates) (opposite)	290
Visual fields of the left eye of a case of optic neuritis (Fig. 5) (colored) (opposite)	296
Visual fields of the left eye of another case of optic neuritis, showing contraction of all the fields with central scotoma for red and green (Fig. 6) (colored) (opposite)	296
A series of drawings showing the relation of the middle cerebral fossa to the mastoid cells and lateral sinuses (Figs. 1, 2, 8, 4, 5, 6, 7, 8, 9, 10, and 11) (colored plates) (opposite)	306-317
Temperature chart of case of mastoid disease in a girl of seven (Chart I.) (opposite)	310
Temperature chart of an adult case of middle-ear disease (Chart II.) (opposite)	312
Three cases of lupus (Figs. 1, 2, and 8) (opposite)	342
Two typical cases of lupus (Figs. 4, 5, 6, and 7) (opposite)	346

FIGURES.

	PAGE
Diagram showing diminution of the cardiac dulness in a case of heart-disease by the use of a saline bath (Fig. 1)	86
Diagram showing more general contraction of the area of cardiac dulness following a second saline bath (Fig. 2)	87
Diagram showing diminution of the cardiac dulness following a third saline bath (Fig. 3)	88
Diagram showing the effect of a simple saline bath on the areas of cardiac dulness (Fig. 4)	89
Diagram showing the effect of a bath of plain water upon the cardiac dulness (Fig. 5)	40
Diagram showing the effects of a combined saline and gaseous bath on the cardiac dulness (Fig. 6)	41
Diagram showing the area of superficial cardiac dulness in a case of cardiac dilatation at the time of admission to the hospital; the same area after eight weeks of treatment, and the area of maximum impulse (Fig. 21) . .	72
Temperature chart showing the pseudo-crisis of lobar pneumonia (Fig. 1) . . .	148
Tabetic arthropathy of the knee-joints (Fig. 1)	168
Tabetic arthropathy of the knee-joints (Fig. 2)	164
Retroflexion of the knee-joint in tabetic arthropathy (Fig. 8)	166
Arthropathy of the left ankle-joint (Fig. 4)	167
Arthropathy of the wrists and phalangeal articulations associated with muscular atrophy of the forearms (Fig. 5)	169
Lateral deviation of the spinal column associated with arthropathy of the wrists, etc. Same case as Fig. 5 (Fig. 6)	170
Knees of the same patient as in Figs. 5 and 6 after aspiration (Fig. 7)	171
Perforating ulcer of the big toe in a case of tabes dorsalis (Fig. 8)	178
Kidney removed by nephrectomy after a gunshot wound (Fig. 2)	241
Relations of the normal kidney to the last ribs and the transverse processes of the first and second lumbar vertebræ (after a dissection made by Professor Bernays) (Fig. 8)	246
Longitudinal section through the head of the optic nerve, showing choked disk (Fig. 8)	292
Cross-section of the healthy optic nerve about five millimetres behind the eyeball (Fig. 4)	295
Cross-section of the optic nerve about one millimetre behind the eyeball (Fig. 7)	296
Cross-section of an atrophied optic nerve about two centimetres behind the eyeball (Fig. 8)	298
Trachoma follicles forming (Fig. 1)	800
Trachoma deposits (Fig. 2)	801
Entropium (Fig. 8)	804
Diagram of the normal naso-pharynx (Fig. 1)	828
Diagram of a mass of adenoid tissue in the naso-pharynx (Fig. 2)	828
Retraction of the right membrana tympani, showing foreshortening of the malleus handle, etc., in a case of chronic otitis media (Fig. 8)	880



PLATE I.—Skiagraph of the normal skull. The nasal bones and the fillings in the teeth are well seen. The cervical vertebræ are distinguishable in the original, but barely so in the half-tone. (Reduced.)

(Taken by Prof. A. W. Good-speed. Copyright 1896 by the *International Medical Magazine Co.*)

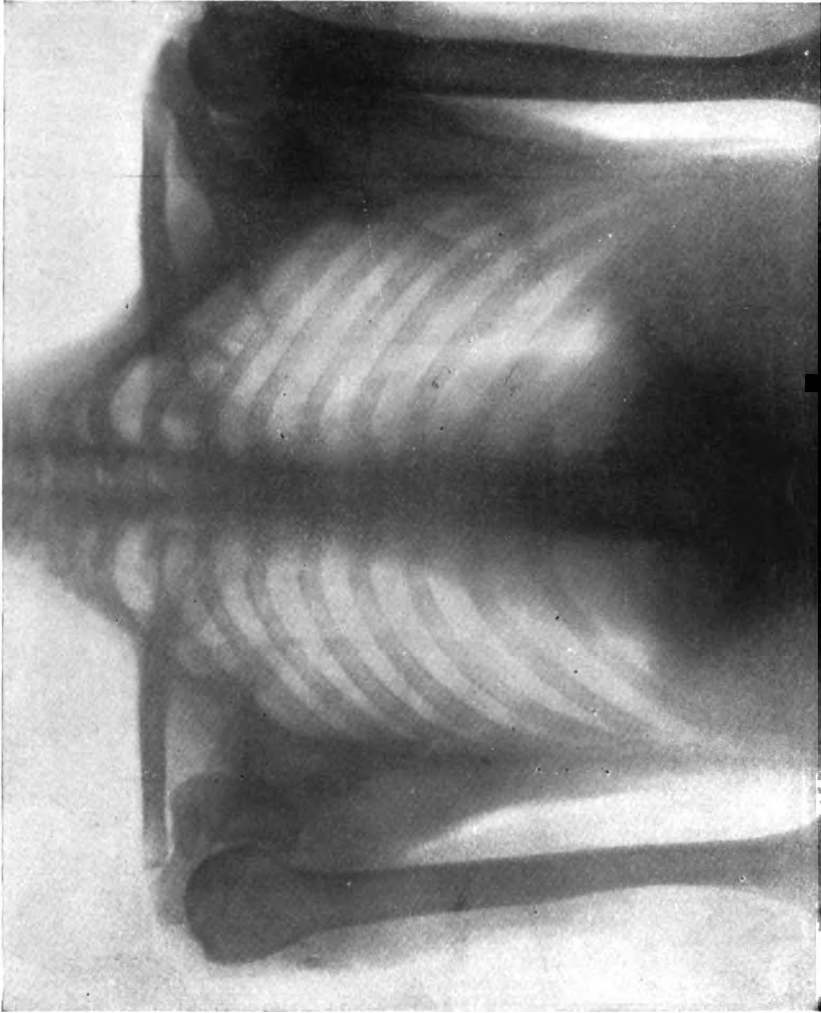


PLATE II.—Skiagraph of the normal trunk. The articulations at the shoulder-joint are beautifully shown. (Reduced.)
(Taken by Prof. A. W. Goodspeed. Copyright 1896 by the *International Medical Magazine Co.*)

Treatment.

THE DIAGNOSTIC VALUE OF RÖNTGEN'S DISCOVERY.

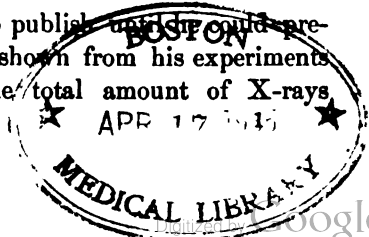
BY HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Pathologist
to the Presbyterian Hospital, etc.

SUFFICIENT time has now elapsed since William Konrad Röntgen, professor of experimental physics in the University of Würzburg, read his preliminary communication, on "A New Form of Radiation," before the Würzburg Physico-Medical Society, to justify the statement that no discovery in medicine has equalled its importance since Pasteur, Lister, and Koch placed bacteriology on a firm scientific basis.

On the 8th of November, 1895, while continuing a series of experiments on the cathode rays, commenced by Lenard, Röntgen noticed that a sheet of paper coated with barium platino-cyanide became fluorescent, even though the Crookes tube from which the cathode rays were being generated was covered over with black paper impermeable to ordinary light. Observing that an object held between the generating apparatus and the fluorescent substance produced a shadow, he was next led to experiment with photographic plates and films, and thus produced the remarkable and now well-known silhouette of the hand with the wedding-ring upon the finger. Announcements of his discovery were soon despatched throughout the civilized world. While the earlier reports were received with incredulity by many, confirmation of the applicability of the discovery to the sciences of physics and medicine was quickly forthcoming from many investigators.

I shall discuss but briefly the important physical part of the work. J. J. Thomson found that the X-rays are capable of discharging electrified bodies, a fact which Röntgen, in his second communication to the Physico-Medical Society, announced that he was familiar with at the time of his first paper, but decided not to publish, ~~and he could present~~ unexceptionable results. Röntgen has shown from his experiments that one-two-hundred-and-sixtieth of the total amount of X-rays



falling upon a plate of platinum at an angle of forty-five degrees is reflected. The American investigators, Mayer, of Hoboken, Wright, of New Haven, and Michelson, of Chicago, find that the rays are neither polarized nor refracted. Rowland, of Baltimore, considers magnesium more permeable than aluminium, just as its specific gravity is less than that of the latter metal.

Henri Becquerel¹ discusses the radiation which takes place from certain uranium salts, which he considers to be intermediate in its properties between light and the Röntgen rays. His experiments were carried on with the double sulphate of uranyle and potassium, which radiates even after being kept in a dark room for one hundred and sixty hours. These rays can affect the photographic plate after passing through copper, wood, etc., which are opaque to ordinary light, and they are able to discharge an electrified body, whether the charge be positive or negative, thus showing themselves similar to the Röntgen rays. On the other hand, they resemble ordinary light in the facts that they are refracted and polarized and that they are very readily reflected. Troost, of Paris, finds that fluorescence is produced by the hexagonal crystals of zinc and sulphur.

The method of taking a skiagraph is very simple,—in fact, so easy of accomplishment that when seen for the first time its simplicity excites astonishment, which is quickly followed by disappointment, to be finally replaced by a feeling of awe. The process is as follows: The photographic plate is wrapped in rubber mackintosh or placed in a wooden plate-holder, or you may have the plates supplied directly from the factory properly protected from light in envelopes or else covered with orange or black paper. Be sure that you do not keep your plates in the same room with the generating apparatus, else they may become fogged from the X-rays coming in contact with them. Tesla, with his powerful disruptive coil and single electrode bulb, has readily taken pictures forty feet away from the Crookes tubes. The plate is then placed on a firm table, and the object to be pictured is laid on the plate.

Remember, we are dealing with shadows, and the closer the object is to the plate and the greater the intensity of the rays starting from the tube, in a luminous point instead of a surface, the sharper will be the actual shadow or silhouette upon the screen or photographic plate. The Crookes tube is placed from one foot to three feet above the plate, in such a position that the greatest number of X-rays will fall upon

¹ Nature, April 28, 1896.

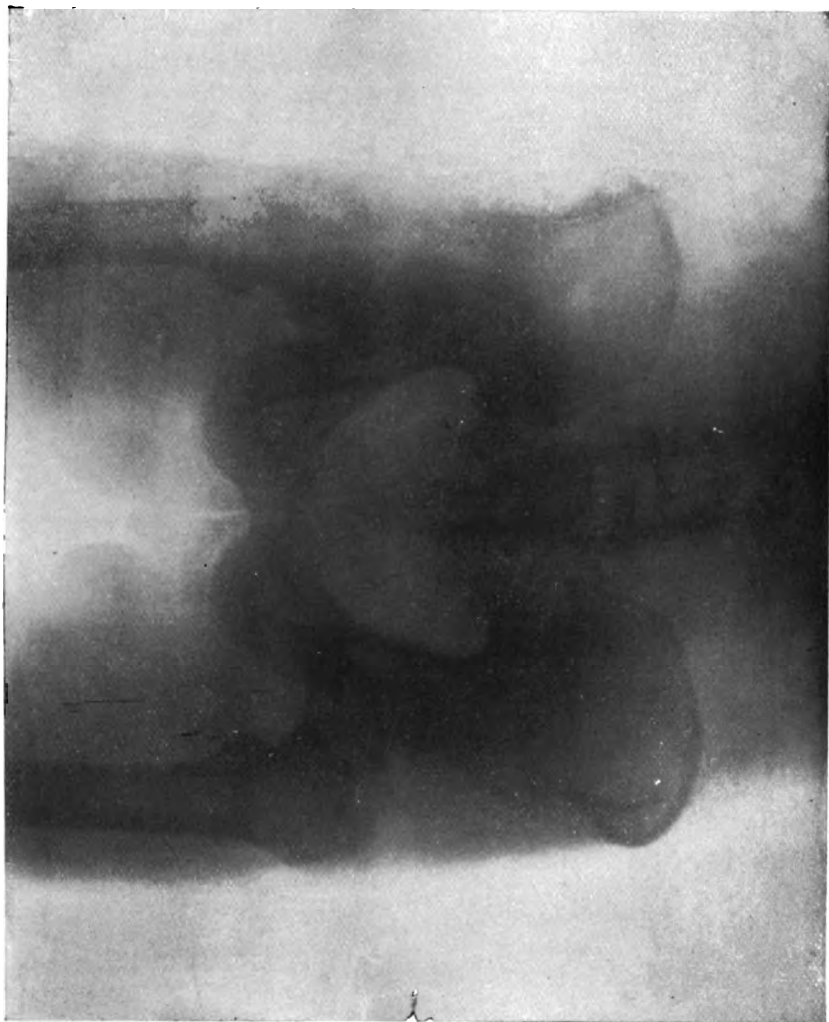


PLATE III.—Shiagraph of the normal male pelvis.
(Taken by Prof. A. W. Goodspeed. Copyright 1896 by the *International Medical Magazine Co.*)

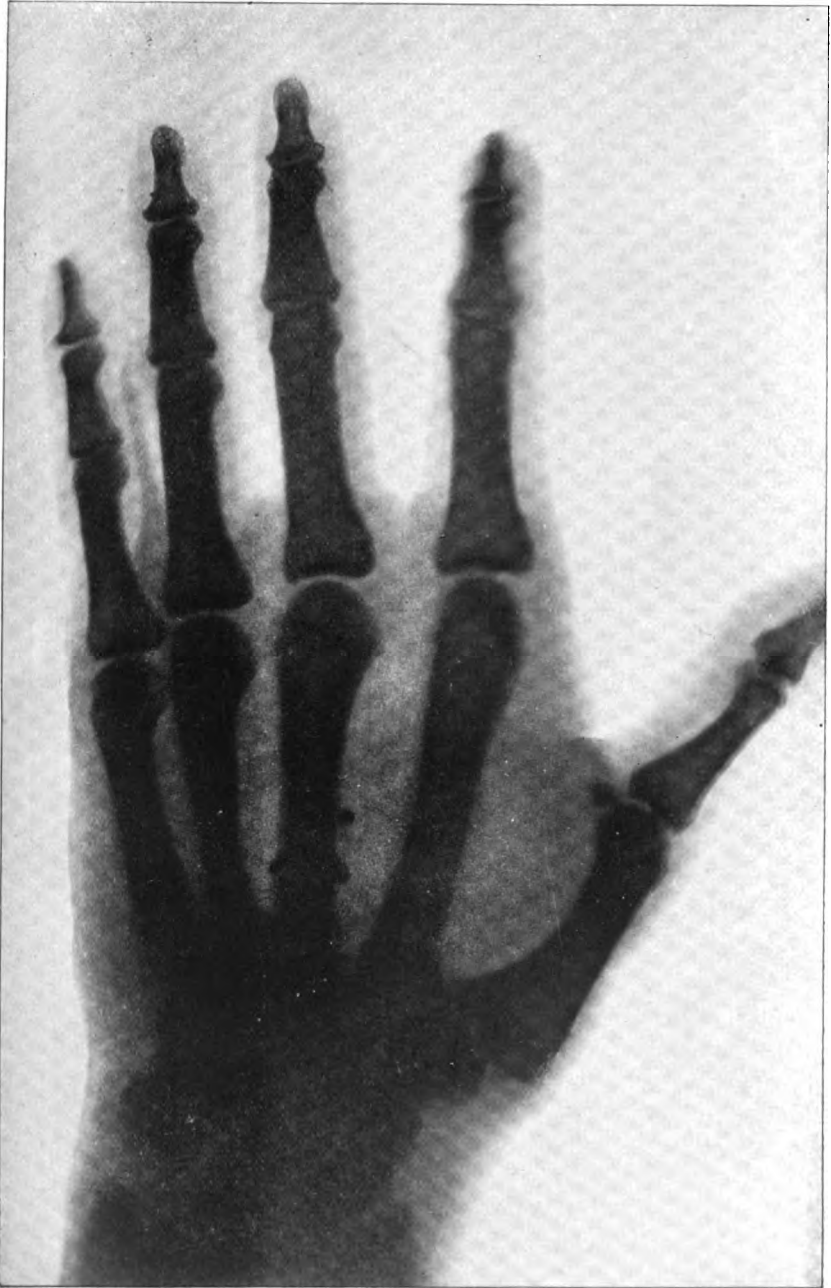


PLATE IV.—Bullets imbedded in lower portion of middle metacarpal bone. The skiagraph was taken through the bandages.

the object to be skiagraphed. The limb or other part which is to be pictured should be made as comfortable as possible; a support under the elbow will contribute much to the patient's comfort. Ingenuity will readily contrive a method of holding the object firmly to the plate, as in the case of the knee or elbow.

The skiagraphic room for a hospital should be a small-sized one, opening into a perfectly equipped dark room, fitted up like the ordinary dark room of a photographic establishment. It should be subject to no jarring, as from an engine or from passing vehicles, and should be capable of being readily darkened, as the eye is able to see more upon the fluorescent screen when in a dimly-lighted room; or a fluorescent screen window may be made to open directly from the dark room into the outer room. The window in the dark room should face the north—to make prints—for the sake of ventilation and light when the room is not used for purposes of developing. It should have two or even three glazed sashes, so that all degrees of light and shade, even to total darkness, may be obtainable. It makes no difference whether ruby or yellow glass be used. It might be well to introduce electricity into the lantern.

The outfit for a hospital—and no hospital is now complete without such apparatus—should consist in a Ruhmkorff coil, giving an eight- to ten-inch spark. A Tesla disruptive coil and Leyden jars may be used in addition. Good results have also been obtained by the ordinary Holtz or statical machines. The coil will always be expensive, an account of the actual cost of the amount of wire in the secondary coil, the writer having worked with a fifteen-inch-spark coil where there were thirty-nine and one-half miles of wire. The Crookes tubes will no doubt be further perfected in the near future; they have already been much improved in the past few months by the introduction of the focus-tube, which brings the limbs into perfect view. Good-speed by a larger tube of this sort has penetrated the head and trunk of the living adult most successfully, as will be seen by examination of Plates I., II., and III. accompanying this article.

The electricity may be obtained directly from the Edison current, by first passing it through incandescent lamps to reduce the voltage. Storage-cells¹ can be used most conveniently, and should be placed in

¹ The writer has been using storage-cells of two volts each, with five ampères. These cells were situated beneath the table. Although guaranteed to run ten hours, they would act efficiently only for seven hours. It is possible that this may be due to their being attached to the coil, or to the fact that the electricity is discharged by the X-rays.

an adjoining room. From ten to fourteen volts are needed, with an ampèreage of from five to ten, and then after passing through the Ruhmkorff coil we may have in the neighborhood of two hundred thousand volts.

There are in the market a number of special plates, which after being exposed may be developed in the same manner as an ordinary plate. It is not wise to develop the pictures too rapidly. More can be seen in the negative than in the print, and much more valuable information can be obtained by watching the plate as it develops, as it has more of a stereoscopic appearance. With proper apparatus it is now possible to take an instantaneous skiagraph of the hand, and it is even claimed abroad that the ear-ossicles have been pictured. A fluorescent substance, such as fluorspar, placed beneath the plate—or, better, a film—diminishes the length of exposure by half or more. Some of the new plates, especially prepared for the purpose of taking skiagraphs, contain fluorescent substances in emulsion. By rubbing the hand over the film they may be made to fluoresce, and thus the plates may become fogged by too much handling.

One or other of the fluorescent screens is an essential. The skiascope of Magie, the cryptoscope of Salvioni, or the fluoroscope of Edison answers the purpose. Edison uses the inexpensive tungstate of calcium rather than the costly barium platino-cyanide, while the English have found potassium platino-cyanide to give the best results. By holding the fluoroscope beneath the table the practitioner may readily ascertain whether or not the X-rays are coming off in the proper manner. A slanting tube might be arranged with a mirror, which could be placed directly under the generating apparatus, with a considerable degree of comfort.

It is not at all surprising to learn that the expedition now being fitted out in England to go to fight in Africa is supplied with suitable X-ray apparatus for the requirements of an active campaign.

Suits for malpractice will undoubtedly occur, but no physician who is abreast with the times need fear them, as the skiagraph will aid him in the more successful diagnosis and treatment of his cases, especially of fractures and luxations. Who a year ago would have dreamed of being able actually to see the displaced fragments in a Colles's fracture, to set the bones, to dress the arm, and then to examine the bones again through the wooden splints and bandages, and note whether or not the broken ends have been correctly approximated! You desire to learn of the amount of callus thrown out, to determine if sufficient union has taken place, so as to be able safely to remove the bandage :

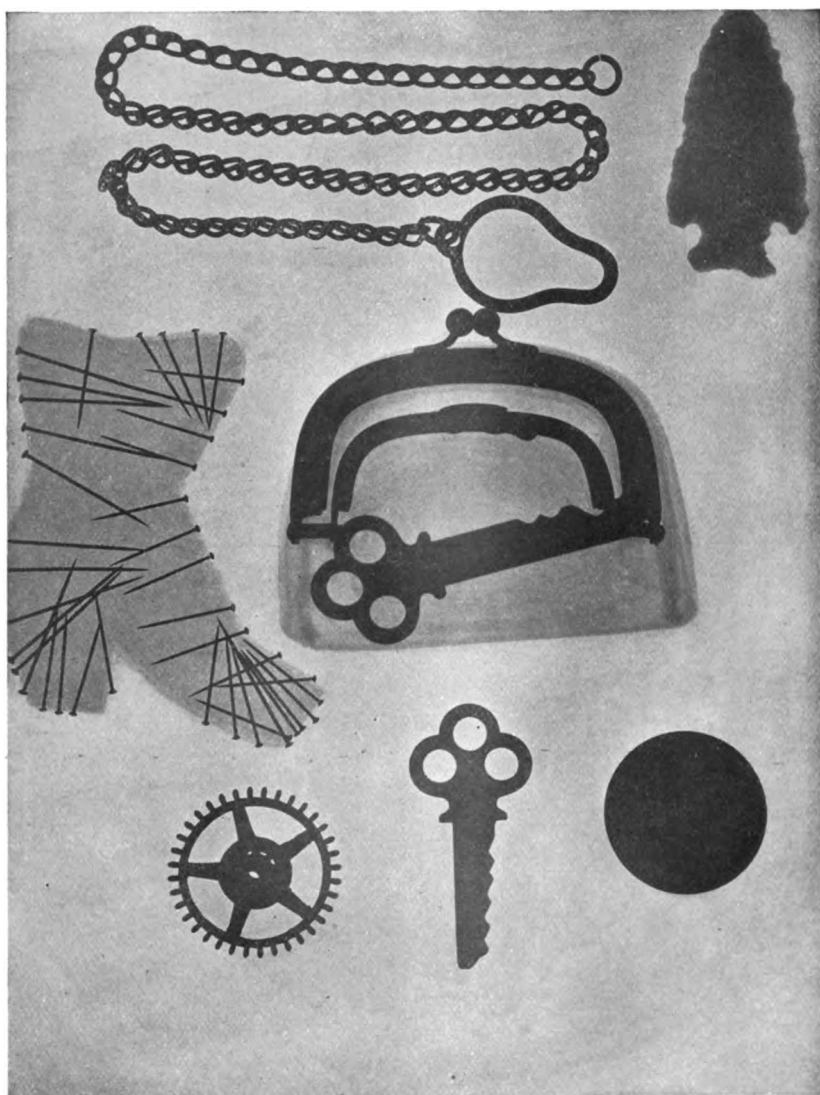


PLATE V.—The various physical objects show very well what can be accomplished by Röntgen's discovery. The pins in the pin-cushion and the key in the purse are hidden objects to the eye, and yet the shadows appear with great distinctness on the photographic plate after two minutes' application of the X-rays. All the objects were taken through eight thicknesses of ordinary mackintosh, which is perfectly impervious to the ordinary rays of light. (Reduced.)

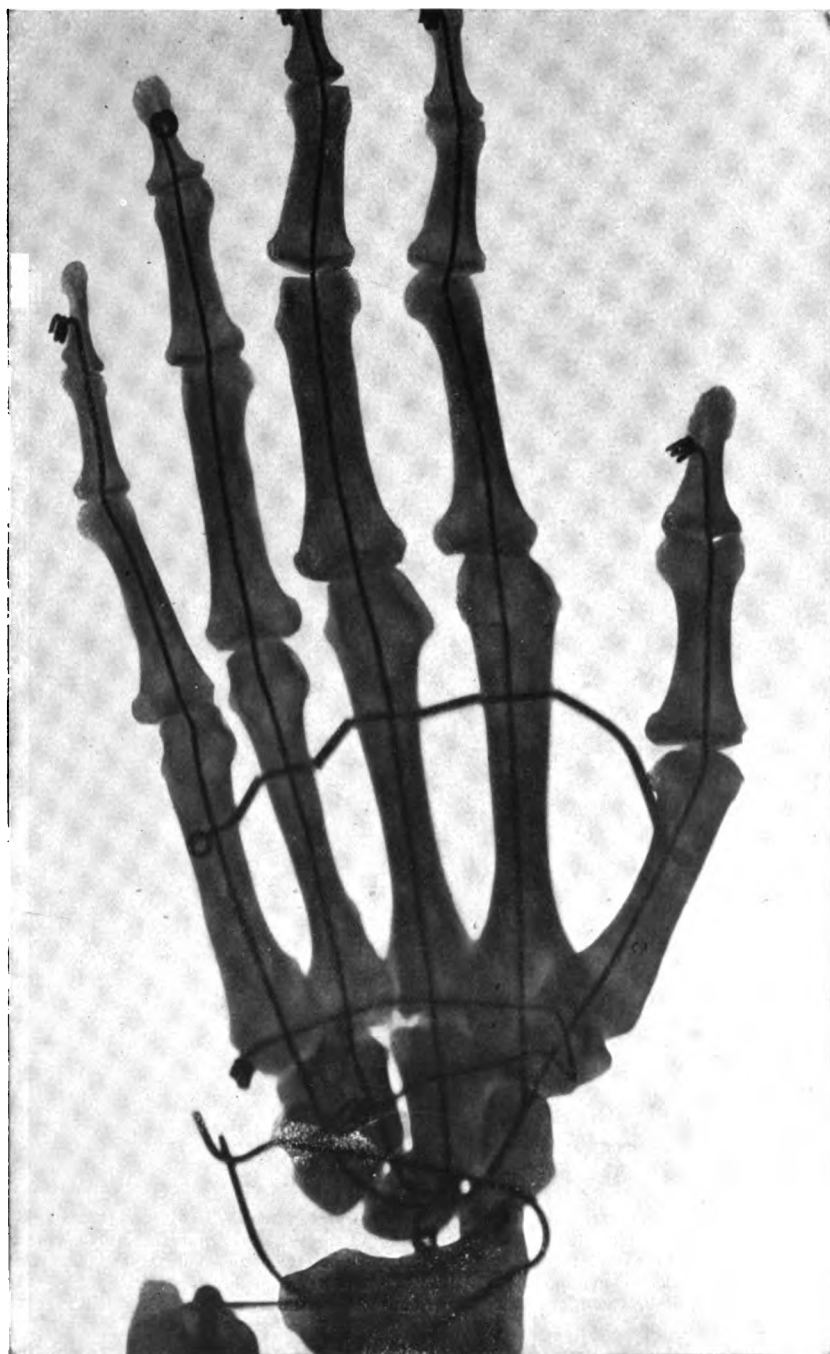


PLATE VI.—Skiagraph of an articulated skeleton of the hand. To be used for comparison with skiagraph of the normal hand. The wiring is seen with great distinctness and sharpness.

an examination by the skiascope will guide you at once in these matters.

The only untoward effects thus far noted from the use of the X-rays have been the falling out of the hair of a physician who exposed his head to the rays, preparatory to experimenting on a child, and a variety of skin affections similar to those seen in sunburn. If this report of the loss of the hair is true, epilation might be accomplished by the application of these rays.

The action of the rays upon bacilli is still *sub judice*. Several competent investigators who have experimented with cultures of the Klebs-Löffler bacillus report negative results. Careful investigations are proceeding in several portions of our own country and abroad, and it would be by no means surprising to find that certain organisms are attenuated or destroyed by exposure to these rays, just as some pathogenic organisms are influenced by exposure to the direct rays of the sun.

The uses of the new discovery are of more importance to surgery than to medicine, though the time is undoubtedly near at hand when atheroma of the aorta and calcification of the mitral valve or of the aortic leaflets will be seen by the skiascope and pictured on the photographic plate. Shadows of the organs may be seen on the fluoroscope, and changes in size and position noted. The absence of a kidney, the presence of dextrocardia, and various other anomalies can be noted. The situation of an abscess in Pott's disease could be determined, especially that portion affecting bone. A tumor of the brain is said recently to have been diagnosed.

The following uses, among many, have already been reported of this newly-discovered form of energy: Kinsing, of Hamburg, and Davis, of Philadelphia, report that they have obtained skiagraphs of a foetus *in utero*. An English half-penny has been located in the intestine, in the neighborhood of the ileo-cæcal valve, in a child aged six. C. L. Norton, the physicist (not a physician), says that by means of a fluorescent screen he was able to make a diagnosis of cases of tuberculosis, pneumonia, and enlarged spleen, without difficulty. The location and removal of shot, needles, bullets, glass, knife-blades, etc., are of every-day occurrence. At the time of writing this article, a patient of Dr. Wharton walks into the office, and a twenty-two calibre bullet is readily and quickly located, embedded in the middle metacarpal bone, as well as several pieces of metal (Plate IV.) in the vicinity. R. Guitéras, of New York City, located a needle by a skiagraph, but on cutting down found that rust from the needle,

which was absent, had been sufficient to produce an impression on the plate similar in outline to that which would have been found had the needle really been present. Von Bergmann's caution in regard to leaving well enough alone in the case of many encysted bullets will bear repetition. The laryngologist has noted foreign bodies in the larynx. Various anomalies, especially of the digits, have been shown. The sesamoid bone should not be mistaken for a foreign body. In one of the first cases skiagraphed by Mosetig, it was difficult in the picture to tell the embedded bullet from the sesamoid bone of the thumb. The writer has been able to diagnose an unsuspected doubling of the metacarpal bone in a case of polydactylism, with webbed fingers. Many bone-diseases, such as tuberculosis, syphilitic lesions, necrosis, osteomyelitis, etc., have been diagnosed. To my mind, the most important use of the new discovery is in the differentiation between fractures and luxations, especially in difficult cases, such as in the neighborhood of the elbow. Rheumatoid arthritis, gout, Morton's foot, acromegaly, osseous ankyloses, club-feet, multiple exostoses, osteoarthritis, tuberculosis of bone, old excisions, ununited fractures, wiring of bones, injected arteries of the kidney and hand, etc., have been pictured.

A very interesting field of investigation, and one which has not been properly worked up as yet, is the differentiation between adulterated and unadulterated chemicals and foods. Every substance has its own degree of penetrability, varying largely, as pointed out by Röntgen, according to its specific gravity.

One illustration outside of medicine will show the wide applicability of skiagraphy: At the initiative of Dr. Dedekino, custodian of the Egyptian section of the Artistic-Historical Museum of Vienna, an experiment has been made in photographing the interior, by the aid of Röntgen rays, of an ancient hitherto unopened Egyptian mummy. This mummy, which has externally the form of a human corpse, was considered to be a "collective" mummy made by the old Egyptians who worshipped the ibis, but this view had not been proved, and, as the specimen was unique, it was not desirable to unswathe it. The mummy was therefore, with the permission of Count Trauttmansdorff, brought into the photo-chemical laboratory of the institute, where the part corresponding to the human head and shoulders was illuminated with the Röntgen rays. The negative and prints showed clearly the outlines of knuckles of birds, and that it contained no human remains.¹

¹ Neue Freie Presse of Vienna, from the Brit. Med. Jour., March 21, 1896.

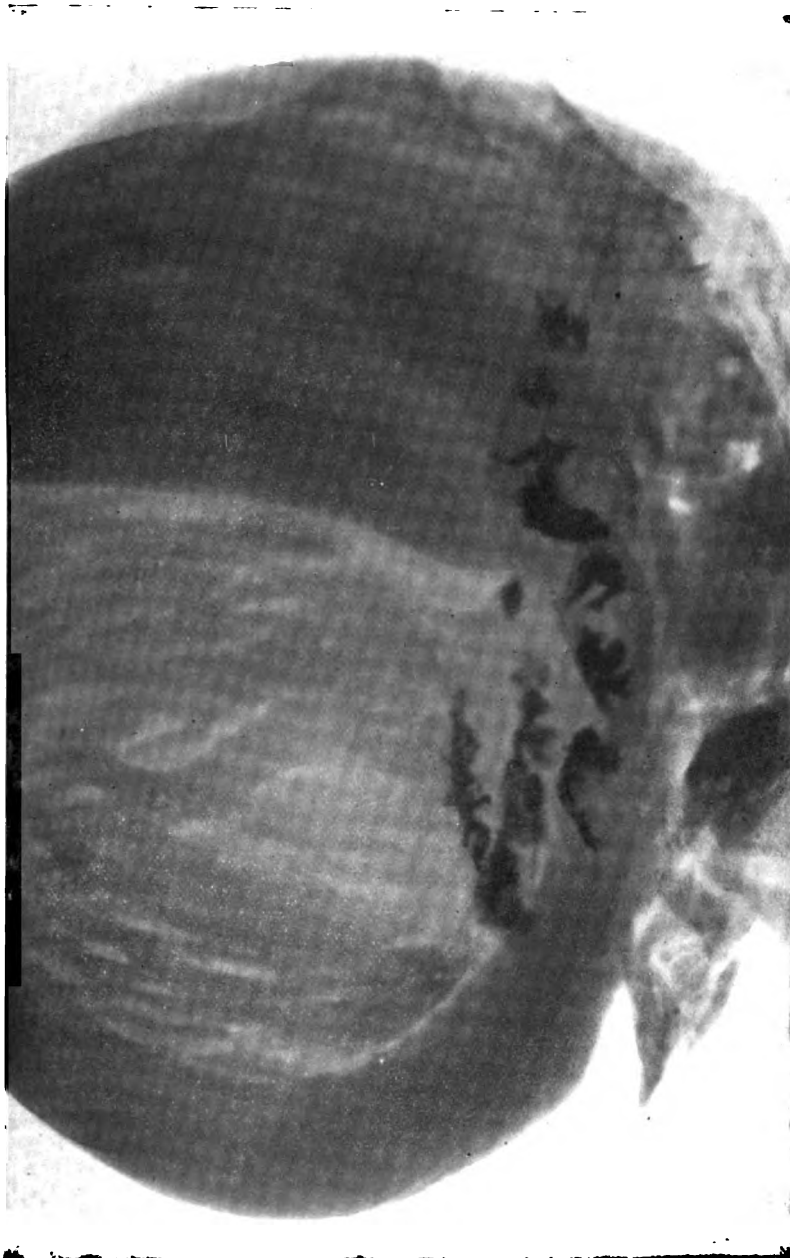


PLATE VII.—Skiagraph of normal adult left hand and wrist, showing sesamoid bone in thumb.



PLATE VIII.—Dr. Packard's case of acromegaly described in vol. xvi. of the *Transactions of the College of Physicians of Philadelphia*. This skiagraph should be compared with the picture of Arnold's case in *Ziegler's Pathology*. Hyperostosis of the phalanges is well shown. The entire outline of the ring on the little finger is plainly seen. Reduced.

PLATE IX.—Sialograph of a dilated and hypertrophied heart, with calcification of the aortic and mitral leaflets. The outlines of the valves are seen with great distinctness, and even the columnae carneae are visible. (Alcoholic preparation, reduced.)



The names of Rowland, Mosetig, Neusser, Thompson, Lodge, Tesla, Edison, Spies, Goodspeed, Magie, Trowbridge, Wright, Gifford, Lannelongue, Hasckek, Lindenthol, Lenz, Thomson, and Pupin will always be associated as among the earliest workers with the X-rays.

In conclusion, let me call your attention to the plate of physical objects (Plate V.) and the plates of various medical subjects which accompany this article. They will illustrate better than words what has already been accomplished, while the imagination of the reader is left to discover new fields of diagnostic usefulness for this most wonderful and practical discovery of Professor Röntgen,—or Dr. Von Röntgen, as we must now call him, for the honors showered upon him include the titular title of a Von and an honorary M.D.

THE TREATMENT OF MALARIA.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY JUDSON DALAND, M.D. (Univ. of Penna.), PHILADELPHIA,

Lecturer on Physical Diagnosis and Instructor in Clinical Medicine in the University of Pennsylvania; Assistant Physician to the Hospital of the University of Pennsylvania; Professor of Diseases of the Chest in the Philadelphia Polyclinic; Fellow of the College of Physicians of Philadelphia, etc.

GENTLEMEN,—The discovery of the parasite of malaria and the increase in knowledge as to its life history enable us to revise the question of the treatment of this disease. But little has been learned regarding the life of the plasmodium of malaria outside of the human body. It is still true that this low form of animal life requires for its existence heat, moisture, and decomposing vegetation, and that malaria is usually found under these circumstances. Naturally, therefore, this disease is most prevalent in our Southern tier of States, especially those bordering on the Gulf of Mexico. In this region the disease often takes on a grave type, attended by hemorrhages from the kidneys or intestines or by coma, and is not infrequently fatal in the third paroxysm. This poison is so prevalent that it frequently complicates other diseases, and numerous examples of forms that are rarely if ever seen in the North are of frequent occurrence.

Malaria is an uncommon disease in Philadelphia and is steadily diminishing, so that most of the cases that present themselves for treatment import the poison from localities in the neighborhood or at distant points. The commonest forms are the tertian, the double tertian, and the æstivo-autumnal, and in a large series of cases observed in the Philadelphia Hospital no example of the quartan variety was recorded. In discussing, therefore, the treatment of this malady, I shall confine my remarks more particularly to that form of the protozoa of malaria that produces the tertian variety of this disease, or the quotidian, which is now considered to be the result of a double infection of the same parasite.

This statement of the cause of this disease leads us naturally to consider the best method of preventing its occurrence. Inasmuch as this parasite gains access to the human organism chiefly by drinking-water and less frequently by the air, many cases of this disease may be absolutely prevented by sterilizing the drinking-water. It is also a well-known fact that malarial intoxication is most apt to occur early in the morning or during twilight or the early hours of the evening, especially when the air contains much moisture, so that avoidance of exposure during these hours is a self-evident precaution.

Numerous observations in Rome would seem to show that the poison tends to remain near the surface, so that those living in the upper stories frequently escape infection while those living upon the first floor suffer. It is exceedingly difficult at times to give relief to a patient suffering from this disease if he continues living in a malarial district, for the reason that although he may recover from the attack from which he is suffering, he is constantly exposed to the risk of a reinfection, as one attack of this disease does not protect from another. Whenever possible, therefore, malarial subjects should be advised to seek a climate that is non-malarial.

The first case to which I shall call your attention was admitted to the surgical ward of the Philadelphia Hospital with a temperature of 102° F., which descended to 97° F., followed by a second paroxysm on the following day.

The examination of the blood showed the usual forms of the parasite that are observed in tertian intermittent malarial fever, and, as the paroxysms occurred daily, a diagnosis of double tertian intermittent malarial fever was made.

Despite the absence of medicinal treatment no further paroxysms occurred. It is evident, therefore, that in this case the removal from malarial surroundings to a locality free from this poison, together with a naturally strong resistance to the disease, enabled this patient to overcome a mild grade of malarial poisoning without medicinal aid. It is altogether probable also that but a small number of the parasites gained access to the blood.

A similar case was admitted to the wards of the University Hospital about two years ago and suffered three paroxysms. He received no treatment, and, although the malarial parasites were present in the blood in small numbers, later examinations showed their absence, and he was discharged without having received the specific for malaria. This patient was so impressed by the frequent pricking of the finger to obtain blood for the numerous microscopical examinations which

were made, that upon arriving at home he gravely informed his friends that he had been subjected to a new treatment for malaria, which consisted in removing a small drop of blood from the finger-tip several times daily !

The third case that I now present, you may remember, showed the typical symptoms of a malarial paroxysm,—*i.e.*, chill, fever, and sweat occurring on alternate days, and the blood contained the malarial body characteristic of tertian intermittent fever. She came from Bristol, Pennsylvania, which locality has a bad reputation for malaria. This patient claims to have had numerous attacks before admission, and that she has had malarial fever on and off for some years. As you will observe, she has improved markedly. On September 18 she was directed to take five grains of sulphate of quinine, five drops of Fowler's solution, and two Blaud's pills every four hours. The following day the temperature was reduced to 96° F., and no subsequent paroxysm occurred. On the third day she complained of gastric disturbance, nausea, loss of appetite, and a sensation of weight and distress in the gastric region, unaccompanied by vomiting. The gastric symptoms were ascribed to the arsenic, which was suspended on the 20th.

The hæmatokrit showed that the blood contained fifty-nine per cent. by volume of red blood-cells, and that, therefore, there was a loss of forty-one per cent. Fleischl's hæmometer recorded forty-two per cent. of hæmoglobin, a reduction of fifty-eight per cent. These results also prove that there was a greater reduction in the amount of hæmoglobin than in the quantity of red blood-cells, and that *each* existing red corpuscle contained seventeen per cent. less hæmoglobin than normal. Eight days after this observation the red blood-corpuscles had risen to sixty-eight per cent., a gain of nine per cent., and the hæmoglobin to fifty-eight per cent., a gain of sixteen per cent.

These figures express precisely the extent and kind of improvement that occurred under the influence of quinine and iron, and she states that subjectively she is much improved. It is evident, however, that recovery will be slow, because of the profound impress made upon her health by the long continuance of the malarial intoxication. A few days later thorough examinations of the blood failed to demonstrate the plasmodium, and we may now conclude that she has been relieved of the disease for which she sought relief, and that she is at present suffering from the effects of the malarial poisoning. The quinine has been reduced to twelve grains per diem. The iron has been continued, and we shall endeavor to resume the arsenic in gradually increasing quantities.

She has been instructed regarding her diet, which should be mixed

in character and nourishing, and we confidently predict her complete recovery in a few weeks.

Our fourth patient has had typical attacks of double tertian fever. The paroxysms were characteristic, and the diagnosis was corroborated by the discovery of the plasmodium in the blood. He received the same treatment as that prescribed for the first patient, and you will observe that he is much stronger than when you last saw him, and has gained in color and general appearance. He states that he feels perfectly well and desires to leave the hospital. This patient was suffering from a very severe paroxysm, and, desiring to control it, between 10 and 12 A.M. a hypodermic injection of five grains of bisulphate of quinine was given four times in different portions of the body, making twenty grains in all. At 1 P.M. the temperature was 105° F., despite the quinine injections. The temperature fell but slowly, and did not reach 99° F. until the evening of that day.

The time of the chill is coincident with the breaking up of the mature pigmented malarial bodies into small spherical masses of protoplasm, which quickly attach themselves to and enter the red blood-cells. Simultaneously a considerable quantity of poisonous materials, probably of a chemical nature, is thrown into the circulation, which is probably the chief cause of the chill, fever, and sweat so characteristic of a malarial paroxysm.

The quinine which was administered, one hour after the chill, was circulating in the blood at a time too late to prevent this poisoning of the blood, and the malarial parasites within the red blood-cell were protected thereby from its local influence. It becomes easy, therefore, to understand why this paroxysm was uninfluenced by twenty grains of quinine injected subcutaneously. The following day the temperature rose to 99° F., and later remained normal. The patient was placed upon five grains of sulphate of quinine, five drops of Fowler's solution, and two Bland's pills every four hours. The first examination of the blood was made six days after admission to the hospital; the red blood-corpuscles were reduced to sixty per cent. and the hæmoglobin to forty-eight per cent., so that there was a loss of forty per cent. of red blood-cells and fifty-two per cent. of hæmoglobin. The individual red blood-corpuscles contained twelve per cent. less of hæmoglobin than normal. One week of this treatment secured an increase of five per cent. in the quantity of red blood-cells and thirteen per cent. of hæmoglobin. This result is especially encouraging, as in most cases the loss of hæmoglobin is recovered from more slowly than the decrease of the red blood-cells. The patient states that he feels per-

fectly well and desires to return to work. As the blood is free from the malarial parasite, we may confidently predict that he will slowly regain his health.

The fifth case which I now show you is in many respects like the last except that his attacks occurred upon alternate days. The blood contained many malarial parasites, chiefly of the intra- and extra-corporal variety. We therefore diagnosed the existence of tertian intermittent fever. He has been taking fifteen grains of quinine, five drops of Fowler's solution, and two Bland's pills daily. He presented no elevation of temperature after the exhibition of these remedies, and an examination showed that there was sixty-six per cent. of red blood-cells and sixty-four per cent. of hæmoglobin. Five days later a second examination was made, showing that he had gained ten per cent. of red blood-cells. His hæmoglobin had remained unchanged. No malarial parasite could be found.

The sixth case is that of a boy who has recovered from an attack of tertian intermittent fever. Subjectively he feels quite well and is about to leave the hospital. Under the treatment by quinine, arsenic, and iron he has regained ten per cent. of his lost red blood-cells, while the hæmoglobin remained unchanged after the disappearance of the fever. Each of these cases was examined repeatedly for the malarial body, more especially the crescentic form, but none were discovered.

The seventh patient that I now present, you may remember having seen one week ago suffering from double tertian intermittent fever. He was treated in precisely the same manner as the cases already shown, but with a somewhat different result. He received his anti-periodic treatment on the 18th, and despite these remedies his evening temperature rose to 103° F. The following day, at 3 P.M., the temperature again rose to 103° F., after which time it remained normal. This is the only example in this series of patients that presented a modified paroxysm after receiving full doses of quinine, iron, and arsenic. He states that he feels well, and, as there has been no return of chill, fever, or sweat, he desires to leave the hospital and return to work. An examination of the blood, however, showed the presence of a large number of the pigmented malarial bodies, and, despite the absence of a paroxysm and the improvement in subjective symptoms, it is clearly evident that he is still suffering from malaria. We consequently increased the quantity of quinine to twenty-eight grains in the twenty-four hours, instead of twenty which he had been receiving, and at the expiration of twenty-four hours

another examination of the blood was made, and again the pigmented malarial bodies were found, but their numbers were greatly decreased. The quinine was promptly increased to forty grains in twenty-four hours, and the blood upon examination showed a large number of crescentic bodies, but no example of the pigmented form. The last examination, made yesterday, showed only one crescentic body after a careful search for twenty minutes, so that we may state that he has now almost recovered from his malarial poisoning. Let us consider for a moment what might have happened if he had been permitted to leave the hospital with instructions to continue the antiperiodic treatment in gradually decreasing doses. Owing to the continued absence of the malarial paroxysm and the improvement in the general health, in all probability the treatment would have been abandoned in a few days. So soon as the specific effect of the antiperiodic was removed the malarial parasites in the blood would have increased and multiplied more or less rapidly, until finally there would have been a sufficient number to bring about a slight irregular fever, or even a paroxysm of chill, fever, and sweat. It is therefore easy to understand, from the study of this case, how relapses may occur. This case has particular importance in demonstrating the value of these blood examinations, not only diagnostically but also prognostically and therapeutically. The continued presence of Laveran's body proved that the quantity of quinine administered was totally insufficient, despite the absence of symptoms. The volume of red blood-cells was fifty-seven per cent., which was increased only two per cent., and the hæmoglobin has decreased five per cent., so that he is still suffering from the destructive effects upon the blood produced by an unusually severe malarial infection. We shall in a few days cautiously decrease the quantity of quinine and continue the arsenic and iron in full doses.

The last patient that I shall show you this morning is a tramp who arrived in this city some days ago from Tacoma, Washington. The only statement that we obtained from him was that he was feeling badly. His temperature showed an irregular range of fever, leading one to suspect the presence of a mild typhoid infection. As there were no other evidences of this disease excepting the existence of a slight fever, we would have sent him to the out-wards, as he complained of no especial symptoms. The presence in the blood of a few crescentic bodies, however, enabled us to make a diagnosis of irregular malaria. The red blood-cells were reduced to sixty-seven per cent. He was placed upon the same treatment which has been already described. The irregular fever promptly disappeared, but, as he is

an old man, considerably the worse for hardships and exposure, his recovery will be slow. In this case we shall later confine ourselves more particularly to the use of arsenic, which will be well diluted and given immediately after food. The dose will be gradually increased until he shows the physiological effects of the drug, when the quantity will be slightly diminished. Before the discovery of the plasmodium of malaria this case would have remained undiagnosed.

I desire to call your attention to one other case of intermittent fever of the double tertian variety, which I had not the pleasure of seeing personally, to whom twenty grains of quinine were given daily at 9 A.M. for nine days. The temperature persisted at times, rising to 100°, 100.5°, and 101° F. As the quinine was given during the hot stage, it seemed possible to explain the failure of the quinine upon the hypothesis that this alkaloid was not able to act upon the parasite because of the protection offered by the red blood-cell which was acting as its host, or from the asserted fact that at this stage in the life history of the plasmodium it is least susceptible. It seemed also plausible to suppose that most of the quinine was excreted in the course of a few hours, so that in its diluted form it was unable to destroy the mature parasite. A simpler and more direct explanation was soon discovered,—namely, that the pills of quinine, which were old and hard, were rejected from the stomach on two or three occasions, and others were found unchanged in the fecal discharges. It becomes important, therefore, in all these cases to consider the question of absorption as well as the administration of quinine. It has been my habit to prescribe the bisulphate of quinine in compressed tablets because of its greater solubility, and to administer it after the patient has taken a small quantity of food. To further insure its solution and absorption I frequently recommend the addition of orange or lemon juice or of hydrochloric acid. A better plan would be to place the finely-powdered bisulphate of quinine between hollow disks of the thickness of paper made from rice flour known as cachets. They readily contain five grains of bisulphate of quinine, and when moistened are swallowed with ease, and the envelope is quickly digested, thus liberating the quinine in the stomach in the form of a fine powder, which permits of its ready solution and absorption.

To infants and very young children I prefer giving a carefully made suppository to administering the salts of quinine partially dissolved, and held in suspension by substances intended to disguise the bitterness, such as syrup of yerba santa, etc. In cases of gastric irritability or vomiting also, it is necessary to administer quinine by

suppository or subcutaneously. Hitherto I have employed the bisulphate of quinine for this purpose, but the bichloride seems to be more soluble and less irritating.

Pills of quinine that have been made for some weeks or months, sugar-coated pills, old gelatin-coated pills, and quinine in capsules should be avoided, because of the uncertainty as to their solution, and not infrequently the patients will have the same experience that was noted in the last case,—*i.e.*, the pills may be found in the intestinal discharges unchanged. The statement of Professor Binz, published in this volume, inclines me to the opinion that the bichloride of quinine would give better results than the bisulphate of quinine. Arsenic should always be given in the form of Fowler's solution. I am informed by physicians practising in the Southern States that not infrequently typical cases of malaria resist quinine and yield to arsenic. They also inform me that occasionally they meet with cases that are rebellious both to quinine and arsenic, under which circumstances they have obtained excellent results from the use of half-ounce doses of Warburg's tincture taken thrice daily after food.

In patients suffering from gastric catarrh or the gastro-hepatic symptoms of lithæmia, it is often desirable to precede the specific treatment of malaria by a short course of broken doses of calomel.

In conclusion, I would advise that the ordinary dose of quinine as a prophylactic be increased from two to four or five grains and that it be administered thrice daily after meals.

THE TREATMENT OF WHOOPING-COUGH WITH QUININE.

BY PROFESSOR C. BINZ, M.D., OF BONN.

TWENTY-SIX years ago I wrote in the *American Journal of Obstetrics* as follows :

“ Whooping-cough is a neurosis of the pneumogastric nerve, caused by infectious and irritating mucus that has accumulated within the larynx and pharynx. Quinine, even when highly diluted, destroys all the cells that are found in the mucus ; of this fact one can easily convince oneself by means of the microscope. Now, I suppose that the mucus of pertussis also cannot remain unaltered by quinine ; for as it passes through the pharynx, the greater portion of the particles existing there will be moistened by it, and thus it will act similarly to the local contact of the throat with astringents, or the inhalation of certain gases in our gas-factories, and to the vapors of the various ethereal oils.

“ So far the results have answered my expectations. In the small clinic which I have established here, I have treated for the past two years all the cases of pertussis, without any exception, with quinine. The best proof of its good effect is seen in the fact that those in charge of little patients repeatedly call again for the bitter medicine, whenever they have succeeded, either by coaxing or by force, in administering it to them. There was a striking difference to be seen in those whom it was impossible to induce to swallow the solution of quinine. In these cases the pertussis assumed its regular obstinate course ; in the others, although living in all other respects under perfectly similar circumstances, the paroxysms were always reduced in frequency and severity.”

What I wrote then has been more and more confirmed every year since, and the number of authors corroborating it is so large that it is unnecessary for me to enumerate even a portion of them. I may mention as one of the latest American contributions a paper by Dr. T. H. Fischer, of Rochester, New York, in the *New York Medical Journal*, May 22, 1895, and in the *Berliner klinische Wochenschrift*, 1895, No. xxxiii.

Only in one point I cannot uphold my assertion of 1870, indeed, I very soon changed it, and that is that quinine exerts a local action. Indeed it is perfectly immaterial how quinine is absorbed by the patient, or how it is administered. The effect is always the same whether it is given by the stomach, by the rectum, or by means of absorption through the skin.

I will now enumerate some of the chief points in the treatment of whooping-cough by quinine, which have been elucidated in consequence of the observations by numerous physicians in a large series of cases since that time.

1. The treatment has to be commenced as early as possible, for the older the whooping-cough the more difficult it is to cure.

2. The doses of quinine must be large: small doses have no effect. The single dose is one-sixth of a grain per month and one and a half grains per year of the age of the patient, three times daily. It is best administered early in the morning, early in the afternoon, and late at night. If the infant is particularly strong the dose generally ought to be a little larger than as stated above. More than six grains three times daily is not necessary even for children who are over four years old.

3. The beneficial effect often does not appear until the third or fourth day. At first the number and violence of the attacks of vomiting usually are diminished, and this is followed by a diminution in the number and violence of the attacks of coughing. The disease then passes into an ordinary bronchial catarrh, which may last for a few weeks, but which is no more a torment or danger for the patient or for his friends. Only if the physician expects the same rapidity of action from quinine in whooping-cough as is obtained from the same drug in simple malarial fever, he will be disappointed, and had better not undertake to use the remedy.

4. It is not well to stop the administration of quinine when the good results are already so well marked that one may think the disease has been conquered; on the contrary, that is just the time to continue the administration of quinine. If this is not done the whooping-cough generally increases in severity, and the treatment has to be recommenced, and carried out as if it never had been started.

5. The best preparation of this drug is the muriate of quinine of the Pharmacopœia. It is more easily assimilated than the sulphate of quinine. It is strange that the sulphate is still employed so much, although it seems to be a very unsatisfactory drug, because of its slight solubility in water (1-740) and because fungi are very apt to form in its solutions. The muriate of quinine does not possess either of these

disadvantages. It dissolves without the addition of acid in thirty-five parts of water, the solution remains clear, and no fungi are formed in it. If hydrochloric acid is absent in the stomach of a patient, which is quite a frequent occurrence, the sulphate remains unabsorbed, and causes as much discomfort as a foreign body. In ordinary cases it is absorbed much more slowly than the muriate, as has been proved by the researches of G. Kerney. The sulphate has probably only been kept in use because the discoverers of quinine in the bark first prepared this form of the salt accidentally.

6. The only drawback to the treatment of whooping-cough with quinine lies in the difficulty of giving it to children because of its bitter taste, and even after one has succeeded in administering it, this peculiar property of the drug frequently causes the expulsion of the quinine when it is scarcely swallowed. The physician is able in most cases to overcome this difficulty if he possesses the requisite patience and tact. The muriate of quinine ought to be administered to small children in solution together with some fruit syrup having a pleasant taste. At first they strenuously object, but they generally get accustomed to it if the parents or nurses have sufficient perseverance and earnestness. In such cases, however, one has to be careful that nothing is lost when the medicine is poured into the child's mouth. To somewhat larger children, who already possess some sense, the quinine ought to be given in fine gelatin capsules. These capsules ought to be rolled in powdered sugar before the children, and the physician may even swallow one before them, or may resort to whatever diplomatic expedient his experience teaches.

It is necessary to give the first of these capsules immediately after an attack of vomiting, for if the quinine by the act of vomiting is brought from the stomach again to the nerves of taste it increases the objections of the patient, so that further administration by the mouth is made impossible.

Quite lately the firm of C. Zimmer & Company, in Frankfort, have introduced so-called quinine pearls, each containing one and a half grains of muriate of quinine. Professor von Noorden says, basing his experience on a large number of cases treated in hospitals, that children over three years of age always swallow these pearls without any objection.

Children never chew these pearls, and the bitter taste is therefore disguised. Nurses have even succeeded in teaching younger children to swallow six or seven of these pearls daily.

7. Quinine chocolate, quinine suppositories, and quinine enemata may be employed in cases where it is found that too much resist-

ance is offered to the administration of the capsules or pearls by the mouth, or in cases in which it seems to be desirable to make a change in the form of administration. The chocolate in the form of pastilles contains also one and a half grains of muriate of quinine, and in them the bitter taste is almost completely concealed. The suppositories containing up to seven and a half grains have to be prepared with absolutely pure cocoa butter, because, if it should be rancid, the rectum is irritated, which causes the quinine to be expelled before it has a chance of being absorbed. The enemata must be given with all the precautionary measures which are necessary to facilitate absorption of the drug by the mucous membrane of the rectum. When quinine is given by the rectum the dose should be slightly larger than it is by the mouth, because absorption is slower and generally part of the drug is lost.

8. Tannate of quinine I have used and found very useful in cases in which the muriate could not be administered in any form. It is a yellowish powder, and only with difficulty soluble in water, and its taste is very slightly bitter, which can be easily covered up by sugar. There are no children who will not take it. Its only disadvantage is that it contains a great deal less quinine than the sulphate and the muriate (thirty per cent. against seventy-four per cent. and eighty-three per cent. of the latter), therefore, one must use a double dose. Its absorption in the intestines is much slower, and in consequence one has to wait longer for the effects; in fact it takes twice as long to act as the muriate does. Notwithstanding all this it is a very valuable drug, and the physician will be pleased to see how the whooping-cough slowly and steadily loses its violence under the action of this drug. There are several preparations of tannate of quinine on the market which contain much less than thirty per cent. of quinine, and these are not to be used under any circumstances. The physician, therefore, has to insure himself first that the preparation he is going to use contains at least thirty per cent. of quinine.

The chemical analysis is very simple; the German Pharmacopœia of 1890 and 1895 describes the method of examination. The Pharmacopœia of the United States of America, 1890, official from 1894, does not contain the tannate of quinine. It is, therefore, exceedingly important that the physician use every precaution to obtain a pure preparation.¹

¹ I may here repeat the instructions given in the German Pharmacopœia. 1. Tannate of quinine suspended in four cubic centimetres of water is mixed with caustic soda solution until strongly alkaline, and the mixture is then shaken three separate

9. Subcutaneous injections of muriate of quinine have been tried and found very efficacious during the course of the last year, especially in the out-patient department of the Children's Hospital in Bonn, by Professor E. Ungar. They cannot be avoided in those grave cases in which quinine cannot be given in any other form. The formula is as follows :

R Quininae muriat., 2 grammes (grs. xxx) ;
 Acid. hydrochloric., about gtt. x ;
 Aquæ dest., q. s. ad 10 grammes (ʒii gtt. xl). M.
 Sig.—For subcutaneous injection.

A preparation which is sometimes preferable is the bimuriate of quinine. The crystals of this salt are soluble in less than their own weight of water. I recommend the following formula :

R Quininae bimuriat., 2 grammes (grs. xxx) ;
 Aquæ dest., 10 grammes (ʒii gtt. xl). M.
 Sig.—For subcutaneous injection.

The single dose the doctor has to calculate according to the total quantity produced by these mixtures, according to the size of his syringe, and according to the age of the child. It is remarkable how well these strongly acid solutions are borne. Only the first insertion of the needle causes any pain. The acid fluid under the skin does not hurt. Of course the physician should choose only such parts of the skin as are of little importance and not very sensitive,—for instance, the integument of the back and the post-trochanteric region. Absorption is very rapid, only occasionally a small necrotic patch of the skin develops ; this is, of course, a very unwelcome accident, but it is a danger which has to be incurred because of the frequently life-saving effect of such injections. It is well to draw the attention of the parents of the children to the possibility of such an ulcer. It heals rapidly and completely. There are some physicians who do not insert the needle vertically into the fold of skin made by the fingers, but who lacerate the corium beneath ; of course such procedures always cause ulcers.

10. If the physician order quinine internally he must be prepared to have the effect of the medicine misrepresented by mothers and nurses. The difficulty of administration and the resistance of the

times with seven cubic centimetres of ether. After the evaporation of the supernatant layer of ethereal liquid, and after drying the residue at 100° C., the residue ought to contain at least four and a half grains of quinine.

children frequently result in nothing being given. Sometimes the parents throw the medicine away, and then tell the physician, in order to dissuade him from using it any more, that they have done everything prescribed, but that it did no good.

If the instructions here given are faithfully carried out, the physician may be sure that he will earn the gratitude of his patients in the treatment of this disease, for which it has heretofore been believed that no specific existed. In a few cases, however, from causes that cannot be recognized, quinine has no effect; however, one has to consider also that certain cases of malarial fever are not cured by quinine. Under the influence of quinine the broncho-pneumonias which so frequently accompany whooping-cough improve greatly and seldom prove fatal. In a very few cases this good result may not be observed.

At the present time no doubt can exist as to the method of action of quinine, thus again confirming what I published twenty-six years ago. Quinine acts directly on the cause of the disease, which no doubt is one of the lowest organisms, although so far it has not been isolated with certainty. The treatment of whooping-cough by quinine, therefore, is more reliable than that by the narcotic remedies. Such drugs as chloral, potassium bromide, atropine, morphine, etc., may diminish the violence of the attacks for a few days, so that a true improvement may be simulated; but the nervous system very soon gets accustomed to these narcotics, and then the improvement ceases. If under these circumstances these drugs are continued, the calmative effect is wanting, and can only be forced by constantly increasing doses. Quinine acts in a totally different manner: the longer it is given the more its favorable influence is apparent. This shows clearly that it strikes the cause of the disease and not the results.

Symptoms of poisoning in consequence of these relatively strong doses of quinine have so far not been observed in children; this is due to the fact that children bear quinine much better than grown people or the aged; but here, too, as with every other drug, we ought to remember the possibilities of the so-called idiosyncrasies, and, therefore, one will have to follow in these cases that general law which teaches us to commence with small doses and gradually increase them to larger ones, which are necessary to the successful treatment of whooping-cough.

Finally, I may remark that quinine was employed in whooping-cough many years ago. Indeed, Hufeland, of Berlin (who died in 1836), wrote on this subject. The essential difference between the ancient and the modern application of this drug is that formerly quinine was considered a tonic for the nervous system, and the idea was

to strengthen the latter in its fight against the disease, which was considered a pure neurosis ; therefore, only small doses were given, which because they were so very much diluted could have scarcely any effect. I, on the contrary, proceeded from the view that whooping-cough, like malaria, is an intoxication of the organism by one of the low parasites which normally rapidly increase in number, and that quinine, as I showed first in 1867, is capable of paralyzing or destroying this parasite as well as others, and that very large doses of quinine are necessary. With this conviction the old opinions and methods became obsolete, and quinine, which in the treatment of whooping-cough had been relegated to oblivion, reappeared in a new rôle.

Probably it will only be a question of time until we will positively know the parasite of whooping-cough exactly, as has been the case with the parasite of malaria, whose existence I predicted years before its actual discovery.

When this has come to pass we shall be able to show that quinine is a direct internal disinfectant against the microbe of whooping-cough, and that the nervous symptoms are merely secondary to the action of this poison. The name tonic, as applied to quinine, is, indeed, applicable only when it is given as a bitter to stimulate the activity of the stomach. It does not exert any direct tonic action upon the nervous system.

THE ANALEPTICS: HEAT; ELECTRICITY; CAFFEINE; NITRO-GLYCERIN; AMYL NITRITE; MORPHINE; ATROPINE; COCAINE; AND CAMPHOR.

CLINICAL LECTURE DELIVERED AT THE GOOD SAMARITAN HOSPITAL.¹

BY JAMES T. WHITTAKER, M.D., LL.D.,

**Professor of the Theory and Practice of Medicine in the Medical College of Ohio;
Lecturer on Clinical Medicine in the Good Samaritan Hospital, Cincinnati, etc.**

PART II.

GENTLEMEN,—Bottles and bags of hot water applied along the spine as well as to the extremities furnish equivalents of heat directly to the body. In the resuscitation of the drowned, a process in which the body becomes extremely cold, care must be taken to keep the body warm in this way.

Electricity is a stimulant of value. Much variety of opinion prevails regarding the best method of using it. For my part I content myself by applying the negative pole to the back of the neck and the positive pole to the pit of the stomach. In a case of profound opium narcosis, which I saw with Drs. W. B. Weaver and J. H. Landis, we succeeded in restoring the respiratory function by occasional faradization of the anterior surface of the chest in such strength as to cause visible contraction of the muscles. Galvanization has been recommended in the same way. It must be remembered, however, that a current too strong may through the vagus inhibit the action of the heart.

The action of the heart may also be stimulated by flagellation of the surface. This process acts through reflex influence, and the best evidence of its virtue is found in the asphyxia of the new-born, where flagellation of the surface often excites the suspended respiration. More forcible flagellation over the region of the heart communicates vibrations to the heart itself, and the action of the heart may be restored in this way in the lower animals where that organ has entirely

¹ Reported by S. Malsbary, M.D.

ceased to beat for an hour and the signs of apparent death have set in. In the execution of this method the præcordial region should be slapped with the hand or flipped with a wet towel eighty to one hundred or one hundred and twenty times in the minute to secure the best effects. From experiments upon the lower animals it has been determined that this agitation of the heart from the outside is fully as effective as direct puncture of the heart, either acupuncture or electropuncture, while devoid of its dangers.

In cases of poisoning with opium, chloral, alcohol, or, in fact, in collapse from any cause, the action of the heart may be sustained by the use of caffeine. When the patient can swallow he may take black coffee as strong as it can be made and as hot as it can be drunk. The coffee may be fortified with whiskey, brandy, or rum. Strong, hot tea is a somewhat milder stimulant. The virtues of coffee are secured in the administration of caffeine, which may be given preferably in the form of the nitro-benzoate. The action of this remedy is more prompt and certain when administered subcutaneously in the dose of three to five grains repeated, in extreme collapse, every fifteen minutes. Caffeine distinctly stimulates the action of the heart through its direct influence upon the muscular tissue as well as upon the nervous system. Caffeine is especially indicated in the collapse which occurs in the course of heart-disease, or in heart failure from any cause. Such heart failure is especially wont to occur in the course of the gravest of the acute infections, diphtheria, scarlet fever, typhoid fever, etc., where the heart muscle is directly poisoned by the toxins of these diseases. It is wise to administer caffeine (or hot strong black coffee) in cases of intoxication by alcohol as soon as the patient is able to swallow.

Nitro-glycerin directly stimulates the heart muscle and exercises its special influence in dilating the peripheral vessels. Therefore, it acts in two ways. It helps the heart both directly and indirectly. For it directly increases the force of the heart and at the same time lessens the resistance which the heart has to overcome in feeding the tissues. Nitro-glycerin has especial value in the treatment of the collapse of angina pectoris and in the advanced stages of Bright's disease, where the hypertrophied heart begins to give way and is no longer able to overcome the obstacles offered by the contracted blood-vessels.

Amyl nitrite acts in the same way but more rapidly. Amyl nitrite is invaluable in the treatment of angina pectoris, where promptness of action is more desirable than permanence. The effect of nitro-glycerin is more sustained. It begins to show itself in three to five minutes, and continues four to six, sometimes as long as eight hours. It is apt

to produce headache at first, but tolerance is soon established, not only to the effect but to the dose, and enormous quantities, as much as one hundred drops, equivalent to one drop of the pure nitro-glycerin, have been administered in the treatment of bad cases of angina pectoris. Amyl nitrite has the advantage that it may be inhaled, three to five drops, from a handkerchief in the stages of collapse. It flushes the face, stimulates the heart, and dilates the surface vessels—often in less than a minute.

On the other hand, nitro-glycerin may be injected subcutaneously in doses varying from one to five drops to a syringeful of distilled water. The range of action of the nitrites is, however, pretty closely limited to affections marked by spastic contraction of the peripheral vessels. Something that would contract these vessels would seem to be a desideratum.

It is thus that digitalis acts, but the action is too slow to be of any great use. As for the various so-called active principles of it, they are too uncertain, unreliable, and even dangerous for subcutaneous administration. An exactly opposite effect upon the vessels is produced by an extract derived from the suprarenal glands. These glands seem to possess an active principle endowed with peculiar potency in stimulating the cardiac muscle and raising the blood-pressure. Schäfer finds an active principle in both the alcoholic and watery extracts of the gland, which when injected into the body of an animal produces even in minute doses a remarkable effect upon certain parts of the nervous system, upon the muscular system, upon the heart, and upon the blood-vessels. Schäfer declares that if only as much as a grain by weight of the suprarenal capsule be extracted with alcohol, and if this alcoholic extract be allowed to dry, and then be redissolved in a little water or salt solution, and injected into the blood of a dog, the results which are obtained, considering the minute amount of substance added to the blood, are certainly most extraordinary. The nervous centre which regulates the action of the heart is powerfully affected. This action is accompanied by a strongly-marked influence upon the blood-vessels, and especially on the arterioles. "The walls of these vessels are chiefly muscular, and the drug exerts so powerful an action upon this muscular tissue as to cause the calibre of the vessels to be almost obliterated. The heart being thus increased in force and accelerated, and the calibre of the vessels almost obliterated, the result is to raise the pressure of the blood within the arterial system to an enormous extent, so that from a blood-pressure which would be sufficient to balance a column of some four inches of mercury the pressure may rise so

high as to be equal to a column of mercury of twelve or more inches. . . . We have to do here with a substance which is as potent, although in a different direction, as strychnia."

Oliver had prepared a tincture of the suprarenal bodies which contains all the active principles, one minim being equal to one grain of the gland. He used the remedy in two cases of Addison's disease, observing in these cases gain in weight, diminution of the pigmentation, and disappearance of nausea and anorexia. The spastic contraction of the vessels which is induced by this extract suggests the use of it as a hæmostatic agent in purpura, hæmatophilia, the hemorrhagic diathesis, hæmoptysis, or other hemorrhage (Oliver). There is at the present time some record of the actual use of the remedy in these conditions but not in collapse of any kind.

Sometimes the strength is best sustained by the subcutaneous injection of morphine, which in small dose, one-sixteenth to one-twelfth of a grain, acts as a direct stimulant to the nervous system. Cases in the collapse of cholera morbus are absolutely rescued in this way. The discharges cease, color returns to the face, the pulse regains its strength, the body recovers its warmth, and the whole aspect of the patient is completely changed in the course of half an hour. The influence of the opium is exerted in these cases upon the vasomotor centres, which have been paralyzed by the toxins of certain micro-organisms (infection) or by ptomaines absorbed from the alimentary canal (auto-intoxication). It may not be maintained that opium exercises anything of an antitoxic effect, though it certainly in some way protects the nerve centres, as opium acts directly upon the protoplasm of nerve matter. Some caution must be exercised in the subcutaneous use of morphine *sub finem vitæ*, that the death be not debited to the drug. In these cases, and in fact in any case of collapse, atropine is a better stimulant.

Atropine also acts directly upon the protoplasm of the nerve centres, but expends its force not upon the psychic centres as morphine does,—and it is this stimulating effect upon the intellect which makes morphine so seductive,—but chiefly upon the centres of respiration, the cardiac centre, and the vasomotor centre, centres which are grouped close to each other for mutual reaction in the pons. The well-known effect of atropine in dilating the pupils is an instance of the concentration of action upon definite nerve centres. Atropine dilates the pupils in consequence of paralysis of the terminal filaments of the oculo-motor nerve in the sphincter iridis with paralysis of accommodation. That the action is not central but peripheral is proved by the facts that a cautious application will produce dilatation in only one eye, and that the same effect is

produced upon the freshly exsected eye. Minute quantities introduced into the blood by subcutaneous injection excite the vasomotor and respiratory centres and restrain the inhibitory action of the vagus upon the heart, so that the pulse and respiration are increased in frequency while the blood-pressure is raised. The stimulating and antidotal effects of atropine are best secured, therefore, by the administration of small doses. Large doses paralyze the heart through the vasomotor centres, dilate the blood-vessels, reduce the blood-pressure, and paralyze the centres of respiration, so that, under the accumulation of toxines, convulsions occur. The maximum dose for subcutaneous use should be 0.001 gramme (about $\frac{1}{80}$ of a grain). Susceptibility to atropine varies in different subjects. In the lower animals atropine produces its local effects quickest upon the eye of the cat, least upon the fish, while it is without any effect at all upon birds. Although atropine will always influence the eye of man, individuals differ in their susceptibility, and the same difference is observed in the general effects after subcutaneous use. Moreover, preparations of atropine vary, so that use should be made only of a salt whose efficacy has been tested, and the first dose should always be small. Thus the physician should make a fresh solution of a tablet in water, which he may sterilize in a teaspoon by boiling. He may use this solution at first in the dose of $\frac{1}{150}$ to $\frac{1}{50}$ of a grain.

There is no doubt whatever about the action of atropine in neutralizing or antagonizing the effects of opium, but there is also no doubt that much harm has been done by overdosage of atropine, and that patients who might have survived a poisonous dose of morphine have been killed by atropine. The maximum dosage must, therefore, never be exceeded. Huchsinger goes so far as to say that no matter what the poison, whether chloroform, or potash salts, or tannic acid salts, or oxalic salts, or apomorphia, or copper, or zinc, or antimony, or quinine, no matter what the poison which stops the action of the heart, atropine will always be able, in the beginning of the paralysis, to renew its activity and to increase the strength of the pulse. Binz declares that he can partially confirm this view. But when in his experiments upon animals he gave the minutest quantity too much, he failed to secure an increase in the volume of respiration and "lost everything through convulsions."

Cocaine is a powerful analeptic when given by subcutaneous injection in a very small dose. Coca itself has long been used to increase the working capacity and to produce the condition of well-being, or euphoria, lessen the sense of hunger, and abolish the feeling of fatigue. Cocaine may be, therefore, given with benefit in the exhaustions of

alcoholism, and in any state of collapse marked by extreme nervousness, unrest, jactitation, etc. I recall the case of a woman who, in the last stages of heart-failure, though bloated with dropsy, was so affected with nervousness as to be unable to stay in bed. The desire to get out of bed became an irresistible mania, and had to be gratified. Her suffering was much relieved by the subcutaneous injection of cocaine, one-sixth, and later one-third of a grain.

Cocaine is, however, a dangerous remedy. It has in it something of the effect of atropine, physostigmin, curare, caffeine, strychnine, and morphine (Harnack), and profound collapse has occurred after the subcutaneous injection of 0.06 of a gramme ($\frac{1}{10}$ of a grain) divided into three doses and introduced in the course of a half hour. Mosso maintains that of all the materials hitherto employed, cocaine will most rapidly and powerfully raise the temperature. It is, he says, the best of the known analeptics. But the effect of cocaine is very evanescent, and to be sustained the remedy must be given in progressively larger doses.

We come now to camphor, which in anything like a proper dosage is entirely without dangerous effects. We have, as we have seen, powerful stimulants in ether, ammonia, strychnine, caffeine, cocaine, morphine, and atropine, but there is danger in all of these drugs. We are using them anyhow at a most dangerous period in the life of the individual. It is easy to tip the balance the other way. Now, it is a great desideratum to have a remedy which is powerful and at the same time perfectly safe; something which we may use without fear of aggravating existing evils and with the absolute assurance of doing good. This want is supplied in camphor, which is one of the oldest of the known remedies and has been used in China as a panacea from time immemorial.

Camphor has some virtue as a parasiticide. The housewife protects her woollen goods from invasion by moths by packing them away with camphor. Camphor has some action also upon the invertebrates; thus leucocytes are paralyzed by the vapor of camphor, and camphor takes its place among the various aromatics as an antiseptic, though it has really but little bactericidal action. Camphor is a stimulant to the whole nervous system. It acts also directly upon the muscular tissue of the heart. In small doses it strengthens the pulse, raises the blood-pressure, and increases the volume of respiration. When the heart of a frog has been brought to a stand-still by muscarine, it may be restored to activity under the fumes of camphor, and when under poisonous doses of chloral the blood-pressure has been reduced to a

minimum in the rabbit, it may be restored again under the action of camphor. This influence is exerted by direct stimulation of the vaso-motor centre in the medulla, and the effect upon the centre of respiration is shown in this animal by an increase of one-third or one-fourth under doses which are perfectly safe.

Camphor acts also upon the psychical centres. Under excessive dosage it causes in dogs and cats acute mania, and in the human being delirium of ideas sets in with unconsciousness and convulsions, first in the face with a peculiar combination of tonic and clonic spasm like that of epilepsy. As in the case of epilepsy, death may occur in the most violent convulsions, but not by arrest of respiration. Animals and man may, therefore, withstand a whole series of such attacks and death follow only after very large doses. The epileptiform convulsions are caused by irritation of the spasm centre in the medulla, but the centres of the cord are excited at the same time, for the reflexes are increased and movements which originate in the cord show themselves after section of the cord in the neck (Gottlieb).

Camphor has always been used as a stimulant. It forms one of the main ingredients of paregoric and constitutes one of the chief virtues of this combination. Small doses of the tincture of camphor produce a feeling of warmth in the stomach, increase the force of the heart, raise the blood-pressure, and stimulate the brain.

The chief virtue of camphor as an analeptic depends upon the rapidity of its action when administered by hypodermatic injection. The best form of administration is in solution in a sterilized oil. Camphor is easily soluble in alcohol, ether, and the fatty oils. The remedy is commonly used in subcutaneous injection dissolved in ether or olive or almond oil. The solution in alcohol is irritating and painful, and the ethereal solution is liable in large doses to produce necrosis of tissue. The safest solution, therefore, is made with the oil of sweet almonds, properly sterilized, in the proportion of one to ten, of which a syringeful may be injected deep under the skin of the back or on the anterior surface of the thigh, as often as may be required. The camphor is quickly absorbed by the lymphatics while the oil undergoes slower absorption. It goes without saying that the syringe must be perfectly clean. The syringe may be thoroughly disinfected and cleaned by filling it with absolute alcohol before and after use.

Alexander found that the injection of camphor increased the appetite and exercised a decided analeptic effect upon the power of motion. He compares it with the action of guanidin, which is said to irritate the terminal filaments of the intramuscular nerve fibres. Binz and

Scharrenbroich found that camphor had a paretic action upon the amoeboid movements of the white blood-corpuscles; that it with the other ethereal oils checked the process of suppuration or arrested it altogether. It is to this action that Alexander attributes its particular value in the treatment of pulmonary and laryngeal tuberculosis. Alexander declares that his expectations as to the value of the remedy were exceeded, as it showed itself in the very grave cases. Adamkiewicz used camphor internally to prevent night-sweats, and Huchard and Faure-Miller speak of the sleep produced by the subcutaneous injection of camphor as "*un sommeil de plomb.*" Alexander makes use of a solution of oil of camphor and olive oil equal parts and applies it once or twice a day to the larynx in the treatment of extensive ulceration. He finds that after the subcutaneous use of fifteen grains of the oil of camphor the swelling of the arytenoid cartilage is so much reduced in bad cases as to prevent the necessity of tracheotomy. The injection of musk increased the appetite, but had no effect upon the lungs. The use of caffeine increased the power of the heart and in this way had a good effect upon the lungs, but it did not improve the appetite and had no influence upon the temperature. Huchard and Faure-Miller believed that camphor injections might prove a substitute for morphine. Alexander injects subcutaneously one gramme of the official camphor oil daily.

Whatever doubt may be entertained regarding the use of camphor in any other way, there is no doubt whatever as to the value of the remedy in the treatment of collapse. We use camphor in this way in all our cases as a routine practice, much after the manner in which the carbonate of ammonia was formerly prescribed. Pribram declares that he has seen the effects of camphor show themselves in the very last hours of life, even after pulsation had ceased in the wrist. Camphor has certainly helped this old lady tide over a crisis more than once.

[NOTE.—The old lady, the subject of this clinic, is still living and in fair condition at the time of this writing, four weeks since the presentation of the case.]

REST, EXERCISE, AND BATHS IN THE TREATMENT OF CARDIAC AFFECTIONS.

CLINICAL LECTURE DELIVERED AT THE KING'S COLLEGE HOSPITAL.

BY I. BURNEY YEO, M.D., F.R.C.P.,

Physician to King's College Hospital, London.

GENTLEMEN,—The application of physical rather than pharmaceutical remedies to the alleviation of the symptoms dependent on morbid conditions of the heart has recently attracted much attention, and I propose to bring before you now some clinical observations especially with regard to the influence of physical rest, of warm baths, and also of certain physical exercises on sufferers from cardiac affections.

No remedial measure is, perhaps, more striking in its effects than that of *rest in bed* in cases of valvular disease of the heart when the compensation has temporarily broken down. I have been long accustomed to say that the best cardiac tonic in chronic valvular disease with failing compensation is *rest in bed*. I have again and again been able to show you patients with valvular disease and all the well-known symptoms of cardiac failure,—dyspnoea, palpitation, cardiac pain, signs of pulmonary and hepatic engorgement, general dropsy, cyanosis,—who after one to four weeks' rest in bed, with little or no other treatment, have lost all these serious symptoms and have been restored to a life of active labor. Such cases are again and again admitted into the hospital, and after a few weeks' rest in bed they return to their household or other duties in a state of comparative comfort.

CASE I.—I had a patient in the Todd ward last summer who was a typical example of the value of this rest treatment in advanced cardiac valvular disease.

She was admitted on May 4, last, complaining of dyspnoea, cough, palpitation, and swelling of the legs and abdomen. She was forty-one years of age and had had nine children. She had had two attacks of acute rheumatism within the last eight years. Her pulse was 64, very small, irregular, compressible, and intermittent. The cardiac apex-beat was very diffuse and the area of superficial cardiac dulness

was greatly increased. There was a loud systolic murmur heard at the apex, conducted into the axilla, and systolic and diastolic murmurs were also audible in the midsternal region. There were marked pulsation and back-filling of the jugular veins. Sonorous bronchial râles were heard over both lungs. There was a certain amount of ascitic fluid in the abdominal cavity, and the sharp edge of the liver could be felt within a finger's breadth of the umbilicus. The legs were very œdematous. There was a small amount of albumen in the urine. Here, then, was a case of complete cardiac breakdown, such as is commonly enough encountered in hospital practice.

The treatment in this case amounted mainly to *rest in bed* with appropriate food.

Digitalis disagreed with her as she suffered a good deal from flatulence and gastric disturbance, for which she took with some advantage pills of creosote and pulvis rhei. She also seemed to derive some benefit from four-minim doses of liquor strychniæ given in our ether and ammonia mixture; but physical rest was the chief element in her treatment. She had by the middle of July recovered sufficiently from all her more serious symptoms to be able to go out for a walk, and soon after she left the hospital and went home.

CASE II.—The next case to which I wish to call your attention was a well-marked case of mitral stenosis in a young woman without any rheumatic history. In the treatment of this case a few weeks' rest in bed proved of great remedial value. She was a bar-maid, twenty years of age, and was admitted into the Twining ward on the twelfth of June last, complaining of pain in the heart, palpitations, dyspnœa, and cough.

Her cough had troubled her for a long time, and had been worse during the last month. She expectorated a good deal and the sputa were sometimes bloody. Her dyspnœa had also been very distressing, so that she had been unable to go upstairs without frequently resting. The pain in the cardiac region had for the last fortnight been almost continuous.

On physical examination all the characteristic signs of mitral stenosis were present, together with those of secondary congestive catarrh of the lungs.

There was a loud, harsh, presystolic murmur at the apex followed by a short, soft, systolic one; in the pulmonary area the second sound was greatly accentuated and was occasionally reduplicated. Some coarse crepitant râles were audible at both pulmonary bases, where the resonance also was somewhat impaired.

The first symptoms to disappear after rest in bed were the cardiac pain and palpitations, then the cough was relieved, and soon she was quite comfortable, and sufficiently convalescent to leave the hospital on the 3d of July, declaring that she "had not felt so well for years."

Here, let me beg you to observe, was a case of serious cardiac valvular lesion with disturbance of compensation falling especially on the respiratory organs, and after three weeks' rest in bed she was completely relieved and restored to active life.

Can the advocates of the indiscriminate treatment of all cardiac lesions by mechanical exercises of whatever nature or design point to better or as good results as these? It is highly necessary, moreover, to insist on this in the face of the widely-spread craze to submit all cases of cardiac lesions to treatment by baths and exercises,—a craze which threatens for the moment to make medical men forget the enormous value of *rest in bed* in restoring the compensation, in cases of cardiac valvular and other lesions, in which it has been lost.

I have yet another case to offer a brief comment upon, of a different type to either of the preceding, in which we had to observe similarly the beneficial and remedial effect of rest in bed.

CASE III.—This patient was a railway porter, sixty-two years of age, who was once a hard drinker, but for the last eighteen years had been an abstainer. He came into the hospital complaining chiefly of dyspnoea and sharp pain in the lower sternal and cardiac regions. There were present the physical signs of general advanced arterio-sclerosis, of dilatation of the aorta with obstruction and regurgitant aortic murmurs, much cardiac hypertrophy, and also well-marked pulmonary emphysema. He had been losing flesh rapidly. There were also symptoms of slight vesical catarrh. He was admitted on the 13th of May and was discharged with all his symptoms relieved on the 2d of June,—a little more than a fortnight,—the chief remedial influence to which he had been submitted being *rest in bed*.

Now, gentlemen, these cases are common enough and familiar to every hospital physician, but it is from the very fact of their familiarity that they excite little attention, whereas, if such results followed immediately on physical exercises or any novel mode of treatment the present stock of drums and trumpets which the world contains would hardly suffice to produce sound enough to satisfy the promoters of the "new treatment." It is with regard to this "new" treatment that I am now about to offer a few remarks. It has long been known to physicians who have had the opportunity of observing great numbers of cases of valvular cardiac disease that probably the majority of

these cases run a course very different from what had been commonly supposed. The late Sir Andrew Clark called the attention of the profession to this in an address delivered at the meeting of the British Medical Association, held at Brighton some years ago, when I was connected with the Brompton Hospital for Diseases of the Chest. I was able to collect, from my out-patient service there and from my patients at King's College Hospital, between sixty and seventy cases of all forms of valvular disease of the heart, who were under my care and observation at one and the same time, and I was able to demonstrate that the majority of them presented little or no objective signs of loss of health, and many had come under treatment simply for dyspeptic troubles, and the presence of a cardiac lesion had only been discovered in the course of the routine and through examination which such cases received.

Since that time an experience of about fifteen years of daily examinations of candidates for life insurance has strengthened the conviction that many of the subjects of chronic valvular cardiac lesions live as comfortable a life and a life as free from any notable disturbance of function as other more healthy people; and I am also well aware that the records of the Clerical Medical and General Life Assurance Association, where many such "lives" are insured, would show that very many such cases live to an advanced age. *Now, the great importance of this fact* in connection with our present consideration is that if from any accidental disturbance of health, possibly of a dyspeptic nature, on examination evidence of a cardiac valvular lesion is discovered in such a person, and should he be gravely informed that he had such a lesion, and that it called for special treatment, it is not to be wondered at that such treatment is followed by a speedy return to health, seeing that a great number of such cases are able to maintain a state of apparent health for many years without any special treatment at all.

You have all heard of a method of treating certain forms of chronic heart-disease by walking or climbing up hills of varying steepness and elevations in a definitely prescribed manner, and known as the "terrain kur," which was designed and advocated by Professor Oertel. You have also doubtless become acquainted with some of the great number of accounts that have recently been published about the method of treating chronic cardiac lesions by saline baths and a special form of gymnastics, "resisted movements," originating at Bad Nauheim, and now identified with the name of Dr. Schott. It should, however, be generally known that the chief part of this treatment was advocated more than twenty years ago by Professor Bencke, of Marburg, who

used to practise at Nauheim in the season, and with whom some years ago I had the pleasure and advantage of visiting these baths. You will, indeed, find in the English translation of Ziemssen's "Cyclopædia of the Practice of Medicine," published in this country in 1876, in Professor Rosenstein's article on "Diseases of the Heart," the following reference to this mode of treatment.

"On account of the important part the vessels of the skin play in moderating and regulating the circulation in the internal organs, we should not undervalue the importance of a regular culture of the skin. Lukewarm, plain, or saline baths with a cold rub-down afterwards act favorably by attracting the blood into the peripheral vessels and by producing a general vigor of the functions through the influence they excite in the sensory, cutaneous nerves. Some time ago alarm prevailed about over-excitement of vascular activity by too hot baths in heart-disease; but the *extremely favorable results obtained by Bencke in Nauheim by the use of saline baths containing carbonic acid, at temperatures from 88° to 93° F., obtained even in cases of severe derangement of compensation and recorded most accurately, have completely set aside this alarm.*"

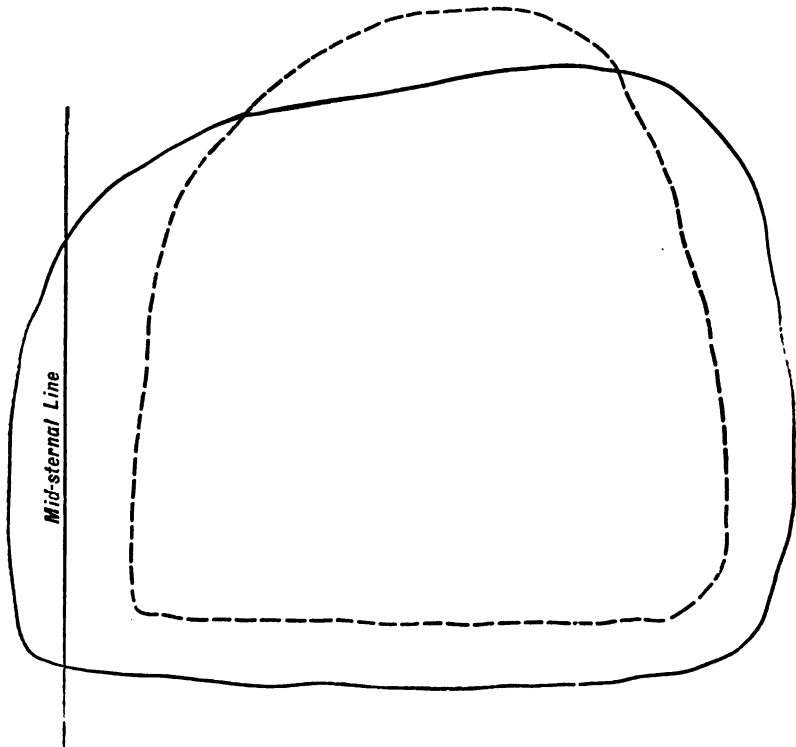
Would any one suspect who has only become acquainted with what has recently been written on the subject of the Nauheim treatment of heart-disease that this description and commendation of it by Rosenstein has been lying on our book-shelves for twenty years? Before entering upon a full consideration of the value of this method as an addition to our other resources in cardiac therapeutics, I should like to call your attention to some observations I have been able to make in King's College Hospital, with the kind and valuable assistance of two of our able and zealous house physicians, Drs. Crawford and Bonsfield, in order to explain the nature and cause of the remarkable changes in the area of superficial cardiac dulness observed to occur in some cases that have been submitted to this treatment.

I determined in the first place to endeavor to test the effect of baths *alone*, both of simple water and the saline and gaseous ones, at a temperature of 94° or 95° F. on the area of cardiac dulness in cases of valvular disease and disease of the walls of the heart.

CASE IV.—The first patient we tested in this way was one most remarkably well adapted to an observation of this kind. Owing to the existence of a great amount of cardiac hypertrophy and dilatation, there existed, as will be seen in the diagrams, a very unusually extensive area of cardiac dulness; and being a young girl of twelve years of age the chest wall was resilient to a degree that would not be found

in the middle-aged or elderly. Moreover, she had been many weeks in the hospital, and the symptoms of failure of compensation with which she had been admitted had been completely relieved by rest in bed and other suitable treatment, so that she had gained as much strength as was possible from ordinary hospital treatment; indeed, she was quite well enough to have been discharged, but I kept her in the hospital on purpose to make these observations. The following is a brief history of the case. She had been in the hospital three times before on account chiefly of cardiac pain, dyspnoea, and cough from congestive

FIG. 1.



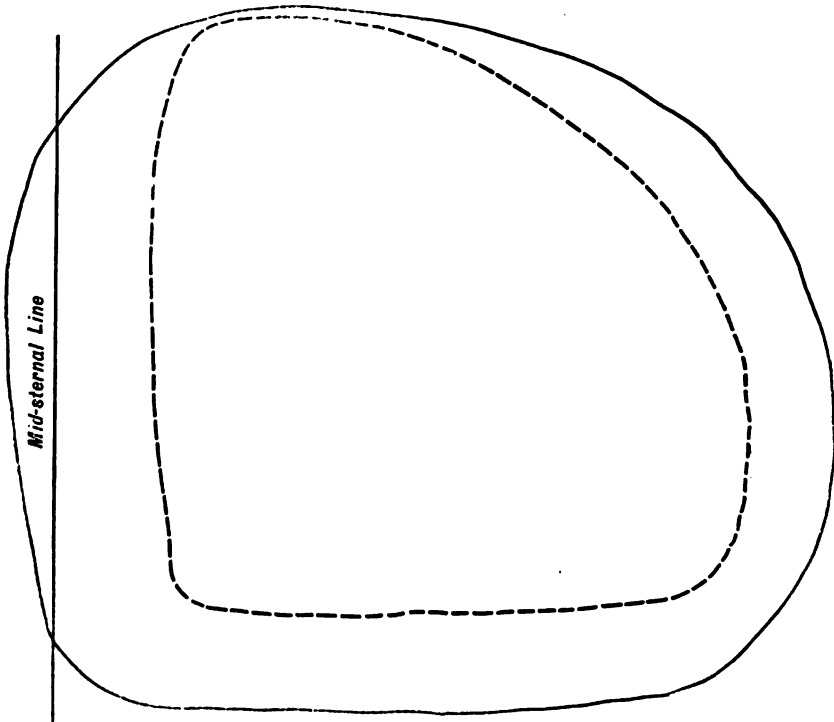
Diminution of the cardiac dulness in a case of heart disease by the use of a saline bath; the black line (—) represents the cardiac dulness before the bath and the broken line (----) its limits after the bath.

bronchial catarrh. There was no distinct history of acute rheumatism, but she was said to have had "intermittent fever" when two years old. On admission the physical signs observed were those of bronchial catarrh with rhonchi and sibili over both lungs, but most pronounced over the base of the left lung. There were also the signs of mitral

regurgitation (a very loud, harsh murmur over the apex conducted into the axilla) as well as the signs of much hypertrophy and dilatation.

On December 1 we gave her a mild saline effervescent bath at a temperature of 94° F. and kept her in it for eight minutes. The pulse before the bath was 86, small, regular, with medium tension; after the bath it was 82. The outline of cardiac dulness was modified in the manner shown in the diagram No. 1; the black line indicating

FIG. 2.



More general contraction of the area of cardiac dulness following a second saline bath.

the outline of cardiac dulness before the bath and the broken line its limits after the bath, as in all the following figures.

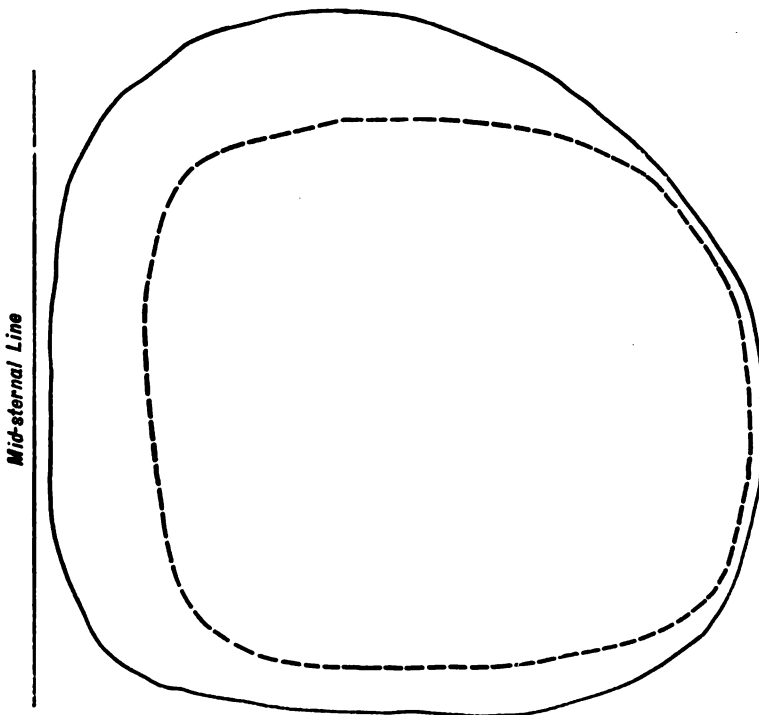
It will be seen that a very remarkable diminution in the area of cardiac dulness was observed after only eight minutes of immersion in this bath at 94° F., and it will also be noticed that the area of dulness is elevated and extends higher at its upper limit than before the bath.

On December 3 we gave this patient another bath of the same composition and of a temperature of 95° F. and also for eight minutes. The pulse before the bath was 84, and after the bath 88 and rather

fuller. We again found a great diminution in the area of cardiac dulness after the bath, but the contraction of the area of dulness was more general, and is shown in Fig. 2.

On reflecting over the cause of this remarkable contraction of the outline of cardiac dulness in so short a time,—eight minutes only,—it occurred to me that it might be partly due to a modification of the type of respiration through the influence of the baths, and that the effect was chiefly a respiratory one. This idea occurred to me from

FIG. 3.



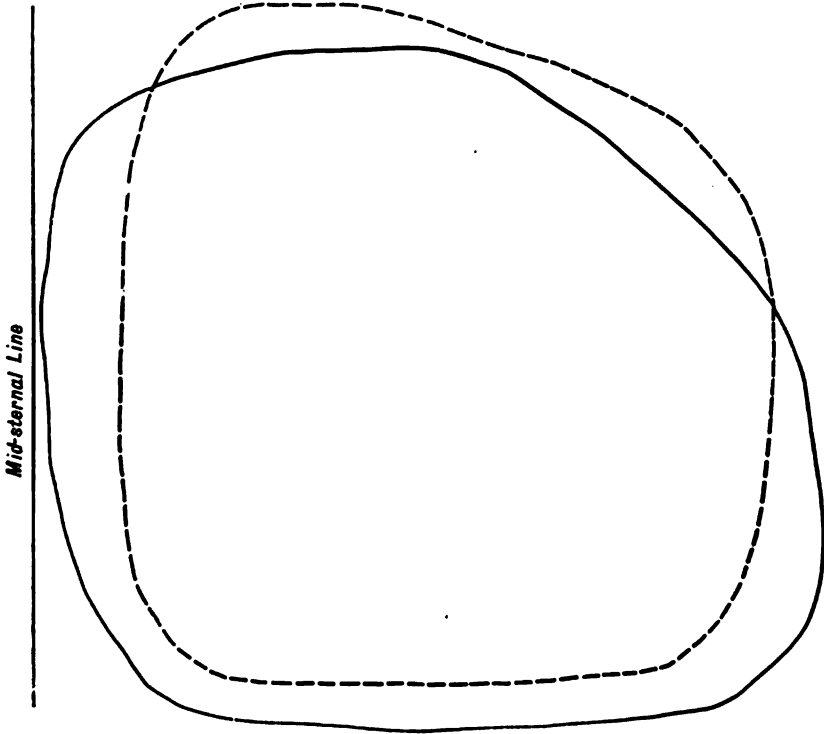
Diminution of cardiac dulness following a third saline bath.

noticing that after the first bath the whole area of cardiac dulness was raised, the *upper* limit extending higher after the bath than before. (See Fig. 1.)

It seemed that the respiration must be changed from the abdominal type, which is the common form in ordinary breathing, to the superior thoracic type, which notably comes into play in deep and forced inspiration. In order to test this supposition I determined, in all future observations of this kind, to take a careful measurement of the chest-

girth in the upper thoracic region before and after the bath ; if my supposition were correct, we should expect that, with the elevation of the area of cardiac dulness, we should find an increase in the circumference of this part of the chest, owing to the establishment, more or less, of the superior thoracic type of breathing in place of the diaphragmatic or abdominal type. We, therefore, on the 5th of Decem-

FIG. 4.



Effect of a simple saline bath on the areas of cardiac dulness.

ber, gave this patient a third bath similar in character and temperature to the two preceding ones.

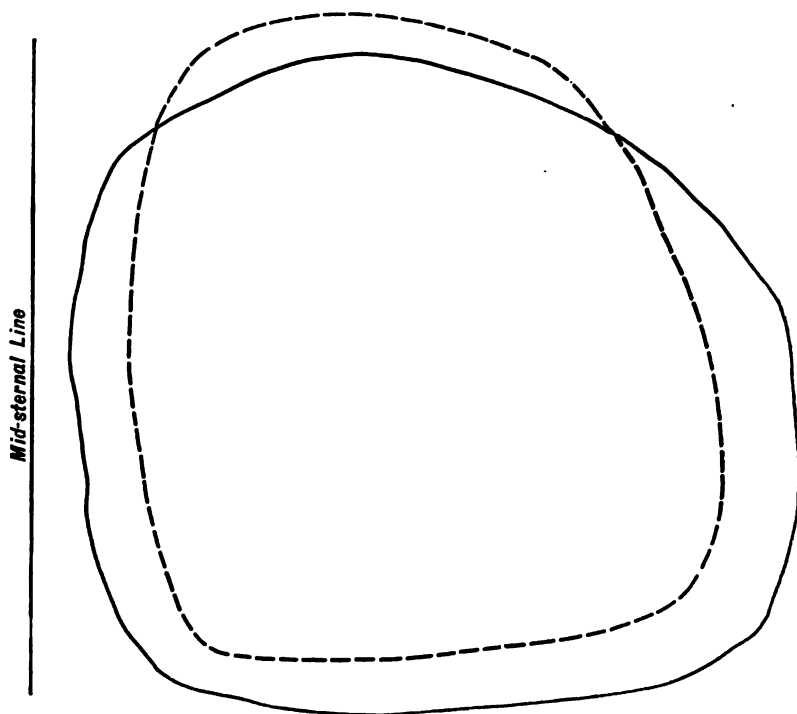
The pulse-rate before the bath was 90, after the bath 96. Fig. 3 shows the outlines of cardiac dulness before and after the bath. It will be noticed here that the outline of cardiac dulness, since the last bath, does not extend, as it did before, beyond the midsternal line.

The extreme chest-girth on a level with the nipples was found to be *before the bath* $26\frac{1}{2}$ inches, and *after the bath* $27\frac{1}{4}$ inches, an increase of three-fourths of an inch.

On December 8 we gave her a simple saline bath without carbonic acid. The pulse before the bath was 80, after the bath 76.

The chest-girth at the nipples was $26\frac{3}{4}$ inches before the bath, $27\frac{1}{2}$ after; an increase of one-half an inch, and the change in the outline of cardiac dulness was as shown in Fig. 4. (It will be seen that the whole area of cardiac dulness is raised and is less diminished than on the previous occasions.)

FIG. 5.

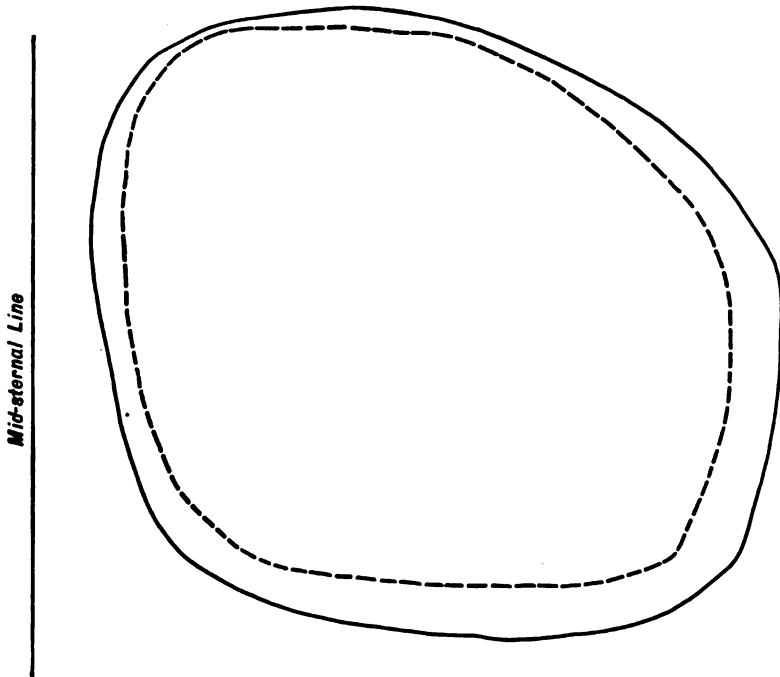


Effect of a bath of plain water upon the cardiac dulness.

On December 10 we used a bath of plain water at 95° F. for eight minutes, with the following result (Fig. 5),—viz., an elevation of the whole area of cardiac dulness and a contraction in all directions but the superior one. It will also be noticed that there has been a sustained retraction of the right limit of cardiac dulness, indicating apparently a sustained contraction of the right side of the heart (that side directly under the influence of pulmonary changes, as I shall immediately explain), while the left limit remains but little affected. The chest-girth at the nipples was $27\frac{1}{4}$ inches before the bath, and $27\frac{1}{2}$ after the bath.

On December 18 (the effects of two baths between this and the last, given in my absence, were not recorded in detail) a saline and gaseous bath of double the former strength was given, with the following result (Fig. 6). It should be noted that, by this time, as will be seen, a considerable retraction of the previously observed area of cardiac dulness had been induced and maintained.

FIG. 6.



Effects of a combined saline and gaseous bath on the cardiac dulness.

The pulse before the bath was 90, after the bath 88. The chest-girth at the nipples was $27\frac{1}{2}$ inches before the bath, and $27\frac{1}{8}$ after it. It is most interesting to note in this instance, when very little change in the outline of cardiac dulness was observed, that only a small but yet definite increase of the girth of the superior thoracic region was noted. It is also worthy of remark that a bath of double strength produced less effect on the area of cardiac dulness than one of plain water, but it must also be borne in mind that a considerable reduction of the previous limits of cardiac dulness had been ascertained before this bath was given. We have seen, in all these instances, that the girth of the superior thoracic region, taken with great care at the

level of the nipples, has invariably been increased after the bath ; this observation, with those that follow in other cases, lends great weight to my suggestion that one of the chief factors in determining the contraction of the area of cardiac dulness observed in these cases is an increased expansion of the upper portions of the lungs, the portion least used in ordinary, quiet respiration ; that the type of respiration, in short, becomes changed somewhat, and a superior costal type takes the place to some extent of the inferior costal and abdominal type. This accounts for the rise in the level of the diaphragm and of the apex-beat noted by Schott and others. It accounts to a great extent for the rapid contraction, especially in the right boundary of the area of cardiac dulness, as the marked increase in the capacity of the upper regions of the lung could greatly widen the respiratory area, and would exercise a decided influence on the condition of the right side of the heart in the way of promoting and facilitating the emptying of its cavities.

I have made several additional observations in other cases of cardiac disease with the object of testing the accuracy of the suggestion I have here advanced, but the details of these observations I must reserve for a future lecture.

THE SURGICAL TREATMENT OF HERNIA.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL.

BY WILLIAM BURTON DE GARMO, M.D.,

Professor of Special Surgery (Hernia) in the New York Post-Graduate Medical School and Hospital.

GENTLEMEN,—As you know, but little time is consumed in these lectures in the discussion of past means of treatment; clinical material is abundant, and we are dealing with the present.

To-day, however, before bringing the cases before you that are in waiting, it is proposed to make a hasty retrospect of the surgical treatment of hernia during the past twenty years.

I do this to bring into marked contrast the operation which we are now employing, in which we are placing great confidence, with those which have been fashionable in their day, but are now almost wholly abandoned because they failed to produce a permanent cure.

In 1876, Czerny gave to the profession his operation, which consisted of tying off the neck of the hernial sac at the external ring, without attempting its removal, and then closing the external pillars of the ring as closely as could be done without constricting the cord.

For ten years, with various minor modifications and under the different names of their authors, this operation held the field, with, as we now know, poor success; and then came, in 1886, the Macewen operation, the influence of which spread rapidly over the surgical world.

As most of you know, this operation consisted in dissecting out the hernial sac, folding it upon itself into a bunch or "boss," which was stitched to the abdominal wall at the internal ring, where it was hoped it would act as a barrier to the redescend of the hernia.

In certain very favorable cases this proved successful, and probably more permanent cures were obtained by it than had been by any method that preceded it.

In 1889 the McBurney operation was published, and was extensively

adopted by American operators. This method differed from all others in that it explored the entire length of the canal and removed all foreign substances. The steps which proved fatal to the success of the operation were in closing the wound by granulation and relying upon cicatricial tissue for the permanence of the cure.

One year later, 1890, came almost simultaneously the publications of the methods of the Italian Bassini and our own countryman, Dr. Halsted, of operations quite similar in character. The advantage was with Bassini, however, in that he reported two hundred cases with his first publication, some of them operated upon six years previously. This method you have seen used in this hospital too often to require any detailed description.

The special points that I wish you to place in contrast with the older methods are these,—

1. That it opens up the entire canal, so that we may remove all foreign substance.

2. That it builds back of the cord a stronger posterior wall than existed before the hernia occurred.

3. That in order to secure the best results, without long confinement to bed, a non-absorbable or at least slowly absorbed suture-material must be used.

Only in the latter particular are we differing from the author in the essentials of the operation. He has used silk for all sutures, whereas we have used kangaroo tendon, and apparently with equally good results, and with the added advantage of having no slow healing sinus to deal with subsequently.

Never in the history of the subject has an operation been used that has been equally certain in its results, and as free from danger. The mortality from the operation itself is a very small fraction of one per cent., and we have every reason to expect ninety-five per cent. of permanent cures, and this with an average confinement to bed of not more than twelve days.

The secret of this great success is largely due to the high ligation of the sac, flush with the peritoneal cavity, and to the removal of all foreign bodies from the canal, and in illustration of the force of this statement I wish to show you some recent cases, most of which you have seen operated upon.

CASE I.—H. P. This man was operated upon three weeks since. We supposed when he came to us that there was an irreducible inguinal hernia on one side, and on the other side a reducible one of the same type. On operating, we found the omentum on both sides grown fast.

The hernia, supposed to be reducible, we found the hardest to operate upon. There were adhesions at the internal ring and in the interior of the abdomen hard to remove. We succeeded, however, in getting everything out of the canal and closing it up. The man has been on his feet since Saturday, and is going home, three hundred miles away, on Monday. On the left side there was an early softening of sutures, causing a little suppuration of the skin. There was no pus, and healing has promptly occurred. On the other side there is hardly a sign of the operation. As you know, the method of Bassini was used. The cord is now immediately behind the aponeurosis of the external oblique. The bandage I want to show you ; it consists of three folds of Canton flannel, and has the advantage of being non-elastic ; the patient can pin it on himself, and the abdominal wall is supported better than it would be with a roller bandage. I place a flat pad under this over each inguinal region. This man had had three attacks of strangulated hernia, and when I first saw him the omentum was in a state of inflammation, which had somewhat subsided when I operated.

A bandage is better than a truss, as it supports more surface and does no injury. I have never used a truss following a Bassini operation and have had no recurrence. If there should be any bulging, a truss should be put on right away, and so prevent a recurrence of the hernia. He will wear the bandage a good part of the summer.

CASE II.—J. B. This patient, fifty years old, was operated upon a week ago last Tuesday for double hernia. There was inflammation, a large amount of omentum had to be cut away, and many adhesions at the ring and inside the abdomen were broken up. There was a large hernia on the right side extending to the top of the testicle. There was some oozing into the scrotum, and the formation of a clot which is now disappearing without opening externally. Sometimes it is necessary to put a drainage-tube through the bottom of the scrotum, but I find that I am doing this less every year. The bandage was taken off on the tenth day. You can just see the line of the incision. We did in fact a double laparotomy, and there were extensive adhesions to break up ; still the man has recovered promptly and without a moment's pain. I think we can congratulate ourselves on the good result. When I first operated for hernia, the mortality was fifteen per cent., but now it is much less than one per cent. As this man is a little inclined to corpulence, I would advise an abdominal belt, with a narrow non-elastic band over the lower part, making firm pressure over the lower portion of the abdomen. In such cases of irreducible hernia, there is no question of the advisability of an operation. The continual danger is

greater than that incurred by the operation. This man has had several attacks of strangulated hernia.

CASE III.—J. F. This man, fifty-five years old, was operated on six weeks ago for the cure of a complete inguinal hernia, and went out of the hospital at the end of three weeks. The wound healed up nicely and everything was all right. He comes back to-day to have another bandage put on. I put on compresses at the internal ring to prevent bulging at that point. These compresses are much better than a truss, because a truss makes considerable pressure over a small surface. It will not be necessary for him to wear a bandage much longer.

CASE IV.—J. M. This boy was operated on five weeks ago for congenital hernia. The contents of the hernia were omentum, a small amount of which was taken away. The cord was transplanted and the wound closed. The funnel-shaped tunica vaginalis was taken out flush with the peritoneal surface, but was not entirely removed from the scrotum. I did not know that the boy was coming or a bandage would have been ready for him. If hydrocele should follow the operation it should be treated as any other hydrocele. There was a small blood-clot under the skin which should not have occurred, but it does not delay healing more than a day or two. All oozing should be checked before the wound is closed to prevent this occurrence.

CASE V.—This boy, seven years old, has had this trouble a number of years. There was a swelling uniform with the testicle which it disguises, and we may have either a congenital hernia or a reducible hydrocele. As I have the patient lie down, I hold the finger of one hand over the inguinal canal and can distinctly feel the return of solid substance to the abdominal cavity. This assures me that we have to deal with a congenital hernia. The chance of curing such a hernia by a truss is not over fifty per cent. in a boy of this age. If an operation is objected to, I usually carry out mechanical treatment for two or three years; if it is not cured then, a truss will never cure it, and the parents will usually consent to an operation. There is great thickening of the tunica vaginalis, and this makes the cure more difficult. Any method of operation will be satisfactory that opens the canal to the internal ring and removes the membranous tube. That is the great advantage of Bassini's operation. If treated mechanically you must see such a case regularly if you expect any success. If this went six months after the truss was put on, without being seen, there would probably be no improvement. He should be seen once a month during the first year. He can sleep with the truss on. It requires strong pressure to retain this hernia. If the surface becomes sore, folds of

cloth may be put between the truss and the skin and the pressure may be decreased, as the case improves.

CASE VI.—This girl had double inguinal hernia. I used Heaton's injection fluid three years ago and cured one side. Now that operative methods are so safe and certain, I have abandoned the injection method. There is still hope of curing the other side with a truss, and the mother objects to an operation. She came to have the truss changed, it having become too small. Girls are usually more easily cured than boys. Pressure must be made on both sides in this case, or there may be a return of the hernia on the other side. If the girl goes to fourteen years of age without a cure, she should certainly be operated upon.

CASE VII.—This boy, twelve years old, has a tumor in the left scrotum. I can map out both the tumor and the testicle clearly, which shows me that it is an acquired hernia. He has had it for a long time, and the chances for a cure by the truss alone are not good. It is better to operate, but, at the parents' request, we will try the truss treatment for at least one year. If, in such cases, the hernial sac goes back, we may expect a cure. I do not believe that this occurs very often in children so old, but I feel certain that it frequently does occur in infancy.

CASE VIII.—This boy, two years old, has had a hernia two weeks. The truss that I shall apply is covered with rubber tubing, making it water proof, and good for use in small children. This hernia is not large, it is of the acquired variety, and I can speak of its cure within the next year with great confidence.

CASE IX.—This man has had his hernia three weeks. It is well down in the scrotum. The case is deceptive as there is but little bulging over the canal, and it looks very much like a hydrocele, but, following it up, you find a good-sized neck to the tumor as it passes through the canal. You can feel the omentum. There will be trouble in keeping the omentum back, and an operation would be advisable. Omental hernias seldom get well under mechanical treatment.

CASE X.—This man has on a truss that was applied two months ago, but it does not hold the hernia. The position of the truss pad is wrong, there is bulging over the top of it, and it is too low and too far towards the thigh. This is a common error in truss-fitting. The truss is a little out of shape also. I will add to the pressure by increasing the curves around the hips. In this case an operation should be done. He will always have trouble and will have to be seen every two or three months. If such cases are operated upon, the omentum must be removed. The omentum has an unnatural and wedge-like shape, and if returned will try to force its way down again.

CASE XI.—This boy, seven years old, has had a tumor in the left scrotum three weeks. It is hard and slips between the thumb and fingers easily. As there are hardness and elasticity, it must be either a fluid cyst or a strangulated rupture, but it is not the latter, as there is no pain. It is not in front of the testicle, and I think it is hydrocele of the cord midway between the top of the testicle and the external ring. We will see if it is reducible. It might be partially reducible if a cyst. If it communicates with the abdominal cavity it would not do to inject it. If it is not at all reducible, it would be safe to inject with a small quantity of carbolic acid. On introducing a trocar we find fluid. There is a good deal of thickening of the tissues.

I usually tap these cystic hydroceles of the cord, but do not inject them unless there is a recurrence. In the latter case I inject from five to ten drops of ninety-five per cent. carbolic acid. The majority of them do not recur after the first tapping.

THE TREATMENT OF ANEURISM OF THE AORTA.

BY G. A. GIBSON, M.D., D.Sc., F.R.C.P. (Edin.),

Assistant Physician to the Royal Infirmary ; Physician to the Deaconess Hospital ;
Lecturer on Medicine at Minto House, Edinburgh.

THE prognosis in cases of aortic aneurism is always serious, for, although life may in some cases be prolonged even for a considerable number of years, the patient is, nevertheless, always in a condition of more or less imminent danger.

It is extremely difficult to formulate any conclusions as to the relative severity of the disease in patients suffering from this affection. It might naturally be expected that the disease would be more serious in those who are compelled to undergo a considerable amount of physical exertion, yet the contrary is often observed. It might further be regarded as likely that cases in which the aneurism is situated at points involving less variation in blood-pressure would be less liable to a fatal termination. The opposite of this, however, is the fact, and my own experience entirely agrees with that of Osler, for cases of aneurism of the ascending aorta have to my knowledge lived longer than those in which the aneurism has been situated farther from the heart. We may regard it as certain that the greater thickness of the wall of the ascending portion of the aorta renders an aneurism in that position less likely to give way under the strain which is placed upon it. In other words, the greater strength of the wall more than counterbalances the great variations of blood-pressure within the ascending aorta.

One element in the prognosis must not be overlooked. The presence or absence of disease of the aortic valves has a most important influence. When there is aortic incompetence the outlook is much less hopeful than when the cusps are competent. There can be no doubt that the excessive fluctuation of the arterial pressure in aortic regurgitation exerts a baneful influence upon any aneurism.

When we approach the question of treatment, it must be confessed that we have a somewhat discouraging subject to deal with. In very

many cases, even from the first, little can be done except to palliate suffering. In a considerable proportion, however, it is possible by careful treatment, not only to alleviate the symptoms, but even to aid in bringing about recovery. It must never be forgotten that the result of post-mortem examinations shows us a very considerable number of instances in which aneurism, unsuspected during life, has been seen in a condition of complete obliteration after death. This fact alone shows that aneurism is amenable to the reparative processes of nature.

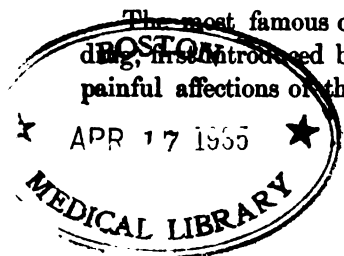
In the treatment of aneurism there are many points which require the most careful attention. Rest is absolutely necessary, and, if it be possible, it should be complete. By means of rest alone, without any modification of diet, and without the addition of any drug, there is a considerable change in the number of pulsations and in the pressure of the blood. The blood-pressure, further, does not undergo nearly so much variation, and the natural tendency to coagulation within the sac is thereby increased. While absolute physical rest is enjoined, in cases where it may seem to be necessary, and they form the greater proportion of cases of aneurism, there should be, as far as is possible, a cessation of mental effort, for this also is attended by changes in the blood-pressure and in the pulse-rate.

The diet, further, should be regulated; and the combination of absolute rest and appropriate diet formed the treatment introduced by Tufnell, of Dublin. The diet recommended by him is extremely restricted: for breakfast, two ounces of bread and butter and two ounces of milk are allowed; for dinner, two or three ounces of meat along with three or four ounces of milk; and for supper, two ounces of bread and two ounces of milk. It is believed that this low diet lessens the amount of blood, it certainly reduces the blood-pressure, and, therefore, favors coagulation.

It is further held by some authorities that it is important to increase the amount of fibrinogen contained in the blood, and in this way also to aid in the natural process of recovery by depositions within the sac. This is a point, however, that cannot be regarded as certain.

Certain drugs are of value in this connection, inasmuch as they assist rest and diet in the treatment of aneurism. Nay more, we may say that even in spite of the absence of rest and carelessness in diet, some of these remedies are still beneficial.

The most famous of such remedies is iodide of potassium. This drug, first introduced by Graves, of Dublin, as a means of alleviating painful affections of the fibrous tissues and nervous system, was ob-



served by Craig, as mentioned by Balfour, to have produced perfect relief from pain in a case of aneurism. Somewhere about the same time the use of iodide of potassium appears almost simultaneously to have been investigated in Europe and Asia by different observers. Nélaton and Bouillaud in Paris, and Chuckerbutty, of Calcutta, found that great relief was obtained by the use of the iodide in cases of aneurism, and that almost complete recovery ensued if the drug was sufficiently persevered with. Roberts, of Manchester, somewhat later employed this remedy in a large number of cases, but it is to Balfour of this city that we owe the extended employment of this drug.

Unfortunately, we do not yet understand the *modus operandi* of iodide of potassium. It was held by Chuckerbutty that the drug increased the coagulability of the blood. This, however, is more than doubtful, when we consider that the remedy is one which has such a marked effect as an absorbent.

It is well known that iodide of potassium has some influence in reducing the blood-pressure and in diminishing the frequency of the heart. The amount of reduction of blood-pressure, however, is extremely small, and the diminution in the rate of the heart is inappreciable with ordinary doses of the drug. It has been shown by Sée and Lapique that the first effect of iodide of potassium in a small dose is to increase the blood-pressure and to diminish the frequency of the pulse, and that if the dose is increased the blood-pressure falls, while the rate of pulsation rises. Balfour strongly recommends that, in the administration of iodide of potassium, such a dose should be administered as will produce some reduction of the blood-pressure without any acceleration of the pulse. He holds that the essential process whereby relief is obtained is through thickening and contraction of the wall of the sac. We may admit it to be extremely probable that under the influence of iodide of potassium the nutrition of the walls of the sac, as well as of the whole of the arterial system, undergoes improvement, and that some of the adventitious products may be removed; but that there is any specific influence such as he suggests may well be doubted.

One of the most remarkable effects produced by iodide of potassium is the rapid disappearance of painful sensations. This is, without a doubt, the most constant and at the same time one of the most useful results obtained by using the drug. The iodide does not only remove or lessen the continuous, dull aching attendant upon aneurisms, but it also obviates or arrests the anginoid attacks which occur from time to time. How it does this is still obscure, and we are just as little able to explain the analgesic effect of the drug as to explain the

undoubted fact that its administration aids in the relief of the other symptoms of aneurism.

Certain other remedies have been employed instead of iodide of potassium. Among these may be mentioned the nitrite series, including nitro-glycerin, nitrite of sodium, and nitrous ether. The effect of these drugs is in every way less reliable than the result obtained from the iodides.

It is often necessary to add certain auxiliary remedies in order to relieve the symptoms of aneurism. Morphine, for instance, must in many cases be employed from time to time as an auxiliary remedy in order to allay pain; and some hypnotic, it may be an opiate or one of the newer remedies, may be urgently required from time to time.

In order to show you that under medical treatment considerable amelioration of symptoms may be produced, and that life may be for some years prolonged, the following case may be mentioned.

W. D., aged thirty-nine, a lamplighter, formerly a seaman, came under my notice during the year 1880, at the New Town Dispensary, complaining of pain in the chest, throbbing, and breathlessness on exertion.

He was not able to fix very definitely when the symptoms began to trouble him, but they had been present for some months. They began with pain, but the palpitation and breathlessness developed rapidly after the onset of the pain.

Many years before he had suffered from syphilis, but with this exception his health had always been satisfactory.

His family history was good in every respect.

From boyhood he had followed the sea, at first for several years in her Majesty's navy, and afterwards in the merchant service. During the two or three years previous to coming under my observation he had been engaged as a lamplighter, and in accordance with the antiquated custom then in vogue in this city, he was required to run up a ladder in order to light each street-lamp. In both occupations he had, therefore, undergone a very considerable amount of physical exertion.

On examining the patient it was found that there was a distinct bulging in the third and fourth intercostal spaces on the right side, extending outward to about three inches from the mid-sternum. This swelling showed well-marked pulsation, and on applying the hand over the part, the pulsation was found to be of an expansile character. The apex-beat was in the fifth left intercostal space three and a half inches from the mid-sternum. There was no thrill over any part of the præcordia. On percussion the cardiac dulness was found to begin

at the upper border of the third left costal cartilage. The left border was situated almost four inches from the mid-sternum, and opposite the fourth right costal cartilage dulness existed outward also to very nearly four inches from the mid-sternal line. On auscultation the cardiac sounds were everywhere normal, with the exception of an accentuation of the second sound in the aortic area. Over the swelling there was a soft systolic murmur which was conducted over the upper part of the chest on the right side, and was also carried into the carotid and sub-clavian arteries. The walls of the radial arteries were fairly healthy, the vessels being neither rigid nor tortuous. The blood-pressure was moderately high, the pulsation was regular, and there was no difference in volume or time between the two radial arteries. There were no symptoms connected with any other system of the body; no cough and, except on exertion, but little dyspnoea; no interference with the nervous system, apart from the pain from which the patient suffered; and no disturbance of the digestive apparatus.

In this case there were one or two points which rendered the prognosis less grave than it might otherwise have been. The patient was under middle age, the aneurism was situated in the ascending portion of the aorta, and there was no incompetence of the aortic valves. These facts formed the elements of a better prognosis than is often the case.

His condition was fully explained to him, and he was strongly advised to enter the Royal Infirmary, in order to have the best possible opportunity of obtaining relief. To this advice he gladly consented, and he was, therefore, placed under the care of Dr. Brakenridge, in Ward 31, on September 30, 1880, where he was treated by means of absolute rest, restricted diet, and iodide of potassium. Under this treatment he rapidly improved; in about a month he was discharged at his own request from the Royal Infirmary, and placed himself once more under my care as an out-patient of the New Town Dispensary. In spite of strong advice to the contrary, he persisted in following his occupation as a lamplighter, and, in consequence of bronchial complication, no doubt due to over-exertion and undue exposure, his symptoms became aggravated, and he was again advised to enter the Royal Infirmary, which he did on January 19, 1881. He was placed on this second occasion under the care of Dr. Balfour, in Ward 32.

The line of treatment adopted was practically identical with that pursued in Dr. Brakenridge's ward, but he remained between two and three months in the infirmary, and left it very considerably improved.

For several years he was from time to time seen by me, and he

really acquired considerable skill in the management of his own case. It is perfectly true that he still pursued a vocation involving a considerable expenditure of physical energy, inasmuch as, although he ceased to act as a lamplighter, he undertook the duties of keeper of one of the Edinburgh monuments, which, being a place of popular resort, especially among our transatlantic visitors, involved his ascending sometimes as often as fifty times a day to a height of almost two hundred feet. Such exertion, however, was confined to a short period of the year, and during the remaining months he was able to take good care of himself.

From time to time he took iodide of potassium, but unless he had some respiratory or digestive complication he required no other treatment.

In May, 1891, he came under the care of Dr. Craufurd Dunlop. He was then suffering from cardiac failure, for which he was treated with digitalis, and on which treatment he rapidly improved, so as to be able to resume his duties within ten days.

He was again attended by Dr. Dunlop in May, 1892, for an attack of cardiac failure, and, although he recovered from this attack, he was never so well afterwards, and died somewhat suddenly on October 21, 1892.

The post-mortem examination was performed by my colleague, Dr. Bruce, when an aneurism was found arising from the convex aspect of the ascending portion of the arch of the aorta. The heart was somewhat dilated on both sides, but all the valves were competent. There was no sclerosis of the coronary arteries, and no occlusion of their mouths.

This case forms a most interesting example of a patient, who, in spite of somewhat adverse circumstances connected with his occupation, lived a considerable number of years, and finally did not die from rupture of the sac, but from the indirect effects produced upon the heart.

In addition to the use of drugs we have certain other means at our disposal whereby the symptoms of aneurism may be alleviated, and, in some instances, real improvement may be obtained. One of the simplest of these methods is general bloodletting, originally proposed by Albertini and Valsalva, strongly advocated by the late Hughes Bennett, and also recommended by Fagge. The abstraction of four or five ounces of blood from the arm often brings about a striking amelioration of the distressing symptoms of aneurism by relieving the pressure effects. The influence of this method of treatment may justly

be regarded as in every way analogous to that of those drugs which lower the blood-pressure.

Electrolysis is another method employed in the treatment of aneurism. So far as is known to me it was first suggested by Pétrequin, and in recent times it has been used by Ciniselli and Duncan. The method adopted is to pass a continuous current through the contents of the aneurismal sac. Two needles carefully insulated, except at their points, and connected with the two poles of a galvanic battery are passed into the sac, care being, of course, taken that the points do not touch each other.

It is, perhaps, better to employ only one needle connected with the positive pole, and to connect the negative pole with a large rheophore applied to the surface of the body in the neighborhood. In this way a firm clot is obtained.

Many of you have, no doubt, seen examples of the clot thus formed on the anode. One very excellent instance used to be in the museum of Mr. Duncan, and is now in the possession of Mr. Hodsdon. It consists of an extremely firm clot, in which the anodal needle has left an aperture. Several patients treated by galvanism in this way have been under my care or under my observation. The result in none of these cases can be held to be very satisfactory. Probably, however, in every instance the treatment was only adopted when it was obvious that all other means would fail. It seems to me quite likely that this method of practice has really never had a perfectly fair trial.

Another system of treatment, originally introduced by Moore, consists in the introduction of metallic wire into the aneurismal sac, with the aim of producing coagulation of the blood upon the foreign body so inserted. Fine iron wire is the material which has been most commonly used, but fine wire made of other metals has also been employed; horse-hair and catgut have also been utilized.

The general effect of this procedure is unfavorable; it is apt to lead to inflammation, so that it aggravates the symptoms and precipitates the termination of the disease.

Macewen has been remarkably successful in the treatment of aneurism by a method introduced by himself. His procedure is extremely simple, consisting in transfixion of the aneurism with a pin, and subsequent manipulation of the pin within the sac. After rendering the skin thoroughly aseptic, the pin is introduced so as to penetrate the sac, and pass through its cavity until it comes into contact with the farther side, which it should touch without doing anything more. The pin may then be left, so that the impulse of the blood-current may move

it about, and thus produce irritation of the inner wall of the sac, or it should be moved about by the operator so as to gently tear the lining of the sac. If the former plan be followed, the pin should only be left a few hours, but Macewen says its retention for twenty-four or thirty-six hours appears to have a better effect. He is of opinion that it should never remain more than forty-eight hours in the aneurism. If the other method be employed, after moving the pin backward and forward over the opposite wall of the aneurism for ten minutes, the point should be shifted to another spot without withdrawing it from the aneurism, and after having manipulated the new area, another part may be dealt with. The process is continued in this way until the greater part of the internal surface opposite has been treated.

In Macewen's hands this method of treatment has been markedly successful. No opportunity has yet been allowed me of practising it, but an intimate knowledge of the facts of some cases leads me to speak in the most favorable way in regard to it.

Such are the various operative procedures which have been employed, and of these, those which may be recommended with greatest confidence are bloodletting, for the relief of symptoms, or, when repeated from time to time, as an aid to other remedial measures, and the introduction of the needle, as recommended by Macewen.

THE TREATMENT OF GONORRHŒA.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE.

BY ALBERT MUENCH, Ph.G., M.D.,

Lecturer on Pharmacology, Assistant to the Chair of Materia Medica and Therapeutics, Assistant to the Chair of Genito-Urinary Surgery and Diseases of the Skin, in the Kentucky School of Medicine; Consultant Dermatologist to the Louisville City Hospital and the Children's Free Hospital; President of the Falls City Medical Society; Member of the Louisville Academy of Medicine, Louisville, Ky., etc.

GENTLEMEN,—We have several cases this morning that will be of value to you in differentiating the various localities of gonorrhœa,—a disease to which young men, as a rule, pay very little attention until too late; then, after trying almost everything in the *Materia Medica*, they apply to the general practitioner or specialist, and are surprised if not well in three days, when it will often take as many weeks, months, or perhaps years, to cure them. Gonorrhœa or, more properly speaking, blennorrhagia, commonly known as “clap,” is, as I have said, the most neglected and the hardest to manage of any of the diseases which we are called upon to treat, and, as a rule, satisfactory results are secured very slowly, compared with the amount of work necessary. For this and other reasons physicians, as well as the laity, are beginning to recognize the disease as something more than an ordinary “cold.”

From a surgical stand-point we divide the urethra into three parts,—viz., the spongy, the membranous, and the prostatic. From a genito-urinary stand-point we divide it into two parts,—viz., anterior and posterior, the anterior portion being that part which lies between the external meatus and the compressor urethræ muscle; while that part which lies between the compressor urethræ muscle and the bladder is the posterior portion.

CASE I.—The first case is a man, twenty-eight years old, who had sexual intercourse five days ago. Four days afterwards he noticed a discharge at the mouth of his penis,—the period of incubation, therefore, being four days. As a rule, symptoms make their appearance in from three to nine days, although cases have been recorded in which

characteristic symptoms appeared within a few hours, and some as late as ten to fifteen days; it is seldom later than that.

What we wish to do now is to place this patient under such treatment as will make him as comfortable as possible, and prevent any complications, such as posterior urethritis, epididymitis, orchitis, cystitis, etc. His mind should be purged of all lascivious thoughts; sexual intercourse should not be indulged in; he should abstain from alcoholic liquors; take as much rest as possible, and no violent exercise. He complains of his urine "burning him" when passed, as is usually the case. You notice a red pouting meatus, and he also has a disagreeable, indescribable "feeling" in the penis. Especially is this true at night, when he places himself in the arms of Morpheus only to be aroused by a sudden twinge of pain, to see the penile portion of his anatomy bent in such a position as though it were trying to climb up his back. This, gentlemen, is chordee, which occurs in the early stages of gonorrhoea, and continues over a period varying with the effects of treatment. As we know, gonorrhoea usually commences at the fossa navicularis, and, as the mucous membrane of the urethra is a continuous sheet of membrane, the general tendency of the disease is to pass backward to the prostatic portion, then into the bladder, where it does no little harm. Consequently, we want to put this patient upon such internal treatment as will dilute the urine and cause frequent micturition, in that way keeping the urethra clean, and allow him to urinate without pain. It is well to have the patient drink as much water as convenient; at the same time we will prescribe the elixir buchu et potassii acetat (*National Formulary*). We may give him one teaspoonful of this mixture four times a day in a glass of water, or oil of sandal-wood, minims x; or salol, grains v, in an elastic capsule, giving four or five of these daily. This lessens pain during micturition, thereby materially adding to the comfort of the patient. Other remedies, such as cubebs in the powdered form, balsam of copaiba, Lafayette's mixture (which contains balsam of copaiba and spirits of nitre principally), and many others, may be given for the purpose of allaying burning during micturition until the acute symptoms have subsided.

As gonorrhoea is a local disease of the urethra, internal medication is not sufficient, and we must resort to some method of direct application to the diseased portion. So in a few days we will put this man upon retro-injections. No doubt a great deal of harm is done by the free use of injections with the syringe, as the urethra is not properly prepared. As a rule, this is done before seeking the advice of a physician.

The best way to treat the patient before us would be to put him on retro-injections, first with either hot water or a saturated solution of boric acid, after a week using a solution of the bichloride of mercury or permanganate of potassium, and when the discharge has ceased at the meatus, commence with astringents and follow with straight sounds. For the retro-injections the apparatus employed consists essentially of a glass percolator capable of holding about three or four quarts; to this is attached a rubber tube six or seven feet long; the free end of the tube may be slipped over an ordinary rubber syringe which will fit any sized catheter. This percolator, with its accessories, may be suspended from the ceiling or attached to a pole about seven feet high, and placed close to a sink to catch the off-flow. A quart of the solution is now prepared. If it be bichloride of mercury, commence on 1 : 50,000 and gradually increase the strength. Just here I want to call your attention to an important point. You will find that the urethræ of different patients materially differ in regard to the toleration of mercury. In this case we may be able to use a solution as strong as 1 : 20,000, while in another it would have to be diluted to 1 : 50,000. Therefore, it is advisable to begin with 1 : 50,000, increasing the quantity until you get the proper strength for the individual patient. The patient is requested to urinate to cleanse the urethra, and to allow the medication to become well acquainted with the disease; then you are ready for the catheter. You can use Nélaton's velvet-eye catheter, being careful to have it perfectly clean, washing thoroughly and sterilizing in hot water. The catheter is anointed with vaseline or glycerin and introduced within the urethra until it touches the cut-off muscle; then pulling it forward about half an inch, you are ready for the solution to be introduced into the urethra. The irrigator is filled with the solution, which is allowed to flow through the tube into the catheter; thence out of the mouth of the catheter, flowing against the compressor urethræ muscle, it is forced forward, flushing the entire anterior urethra. Permanganate of potassium, carbolic acid, nitrate of silver, etc., may be used in the same manner. These injections may be given as frequently as two or three times a day, and not less than once a day. As a rule, after two weeks' treatment with retro-injections, the discharge from the mouth of the penis will cease. Then you must not, as many do, cease your treatment; then is the time for active work. While you are able to discover no more pus at the meatus, yet the disease is lodged within the urethral passage, ready to do considerable harm if left alone.

About this time, between the third and fourth week,—that is to say,

at the time when the inflammation has reached the neighborhood of the compressor urethræ muscle,—a suspensory bandage is indispensable. The kind I am in the habit of using is known as the bicycle bandage, made by the Ware Manufacturing Company. As long as the secretion of the urethra is profuse we find pus escaping at the meatus. If, on the contrary, the secretion is scant, tenacious, and clings to the affected part of the urethra, it may be impossible to detect the secretion in this way. At this stage of the disease we have the patient urinate in two bottles. By examining the urine we can tell the condition the patient is in. For instance, while there might not be any discharge at the mouth of the penis (as in a second case which we have just examined), we will have the patient pass his water into two bottles. You see the first urine passed is cloudy, and that in the second bottle is transparent. This has considerable significance. It shows us that the inflammation is confined to the anterior urethra, and has not spread to the posterior portion. In the cloudy urine you will notice a number of fibres; these are known as "tripper fadden," gonorrhœa threads, or pus-fibres. The force of the urine against the urethral wall, as it passes from the bladder, washes the secretion, rolls up this coating of the diseased portion, and carries it out of the penis. At times you will find mucus in the urine that will float, at first inclined towards the surface, but later sinking to the bottom. The "tripper fadden" sink to the bottom at once. Again, you may find the urine cloudy from phosphates, which may be detected by acetic acid. This will clear the phosphatic urine, but will have no effect upon the cloudiness of the urine which is caused by a purulent secretion.

After continuing the irrigations which I have indicated for some weeks, we can then place our patient upon astringents. Sulphate of zinc, sulphocarbonate of zinc, nitrate of silver, sulphate of copper, acetate of zinc, alum, etc.,—any of these may be used. On this patient, Dr. Allan McNally, my assistant, is using four grains to the ounce of sulphate of zinc, commencing at one, and sometimes using as much as five, grains to the ounce. It is not advisable to use an injection that gives the patient severe pain. It should be just of a strength that when introduced within the urethra will cause a small amount of burning to be felt, but never to a degree that will give the patient any considerable amount of pain.

By this method of treatment you can cure your patient. As to time, I will not mention, as each case seems to have a time of its own; but I am sure in very few, if any, will complications develop.

The method of treatment in vogue at present in Paris consists of

intravesical injections of potassium permanganate, as recommended by Professor Janet, who claims that on the tenth day his most severe cases are cured. Dr. Ferd. C. Valentine, genito-urinary surgeon to the West Side German Dispensary of New York, who introduced this treatment in that city, says that under this method the flow lasts until the twelfth day, and gives a very encouraging account of this treatment, which is as follows: Professor Janet recommends that you suspend from the ceiling a glass irrigator; attach to this ten to fifteen feet of rubber tube, whose free end is slipped over a glass nozzle running to a blunt point, which can be pressed into the meatus, filling it completely. This irrigator is filled with permanganate of potassium solution. The solution first used is of a strength of one part of the drug to six thousand parts of warm water. As tolerance is established, this proportion is increased to 1:4000, then 1:2000, and finally 1:1000.

We know that the resistant power of the compressor urethræ muscle is very great. To the inner sphincter muscle, as far as its resistant power is concerned, we need pay no attention. For this reason we must bring considerable pressure to bear upon the cut-off muscle to allow the entrance of the fluid through the canal into the bladder. Consequently, after washing the prepuce, glans, corona, and meatus, the irrigator is raised some distance, then the glass nozzle is introduced into the meatus and the fluid allowed to run into the urethra, and again escape. This is repeated several times until the urethra is clean, and at the same time the irrigator is gradually elevated. Then the nozzle is held within the meatus while the patient breathes deeply and attempts to pass water,—in this way the solution from the elevated irrigator passing through the rubber tube will play against the compressor urethræ muscle, and forcing it open the fluid gains its way into the bladder. Usually 200 to 500 grammes of the solution are allowed to flow into the bladder. When the bladder has as much as it can conveniently hold, the fluid flows forth as a vigorous stream. These injections are made two, three, or four times the first day; twice on the second, third, fourth, and perhaps on the fifth; then a slide is made for microscopical examination, and if no gonococci are found, once a day until all discharge has ceased.

Dr. Valentine, in reporting this treatment, mentions no complication beyond an occasional œdema of the entire penis. I wish to repeat about the disease commencing, as a rule, just behind the meatus in the fossa navicularis and then continuing backward. As this is the case, to my mind the better treatment would be the retro-injections with the catheter introduced to the cut-off muscle, not into the bladder, flushing the

anterior portion only with either permanganate of potassium or bichloride of mercury. If the disease be in the posterior portion of the urethra, then intravesical injections will be necessary. I cannot understand the object of forcing this solution into the bladder when only the anterior portion of the urethra is diseased, and if results are to be gained by the direct application of the permanganate of potassium, why not just wash the diseased portion and leave the healthy part alone?

To sum up : in cases like this, where we have pus discharged from the anterior urethra,—that is, from the meatus to the compressor urethræ muscle,—these cases are recognized by the fact that if the urine is passed into two bottles, the first is cloudy and the second remains clear and transparent.

CASE II.—The next patient is a man thirty years old, a robust, healthy-looking fellow. In this case, which is of two years' standing, there is seldom, if ever, any discharge visible at the meatus. He states that he has been troubled two or three times with attacks of "clap," which he would cure in three or four days, and which, to his mind, were of little consequence, as they could be checked by injections. In my opinion, it is the original attack which has been several times renewed. We had this man pass his water before coming in, and find the first cloudy and the second half transparent. He has a trouble of that nature which calls for the introduction of steel sounds to stimulate the deposit and cause the same to be absorbed.

Otis was the first to call attention to these alterations in the urethra, and named them "strictures of wide calibre." In these cases the treatment consists in the introduction of steel sounds, and the sound should be of such a size as will slightly distend the canal. If the meatus be found too small to allow the entrance of a sufficiently large sound, you must do a meatotomy, and in many cases where we have the "morning drop" this alone will cure the patient. Especially is this procedure valuable in cases where there is a very small meatus, and the disease is just behind the meatus. This is best accomplished with a meatotomy knife, without an anæsthetic, as it only requires a minute to perform the entire work. A few cuts are made at the median line of the floor until you have the desired size. After the operation a piece of gauze is placed in the cut so as to prevent union.

This patient should pass a sound every other morning, and an injection of three grains to the ounce of zinc sulphate will be ordered, to be used by himself three or four times a day after urinating.

The hour being up, gentlemen, we will have to postpone the further consideration of the treatment of gonorrhœa until our next clinic.

EXTREME DILATATION OF THE HEART DUE TO VALVULAR DISEASE, WITH SPECIAL REFERENCE TO TREATMENT BY THE SCHOTT METHOD.

CLINICAL LECTURE DELIVERED AT THE ST. PAUL CITY AND COUNTY HOSPITAL.

BY CHARLES L. GREENE, M.D.,

Instructor in Physical Diagnosis and Clinical Medicine in the University of Minnesota; Visiting Physician to the City and County Hospital, University Free Dispensary, etc., Saint Paul, Minnesota.

GENTLEMEN,—This case is one which has been demonstrated once before to certain members of your class, and I now bring him before you as an illustration of the remarkable results to be obtained at times in apparently hopeless cases of dilated heart, and more especially to illustrate the beneficial effects of rest combined with saline baths and gymnastics, after the method of the Brothers Schott.

Those who have seen the case before will see a remarkable change in the man's condition, and we shall make that change still more evident by a review of the case in detail and the careful tracing of the superficial cardiac dulness,—first, as it was upon admission, and second, as it now exists. I am indebted to Dr. Arslanides, our senior house physician, for the case record which follows:

Case History.—The patient, Frank G., a Bohemian, was admitted to my service upon October 17. He is by trade a stone-mason. His build is powerful and muscular. His son states that he has been an exceptionally hard-worked man and a large consumer of beer. He appears fairly intelligent at present, although dull and apathetic at the time of admission. His health record in the past shows no severe illnesses, and both syphilis and rheumatism are denied. The family history yields a fact of some importance,—viz., that his mother and one sister died of dropsy after a long period of failing health.

His own children are not strong. One is a consumptive, another mentally deficient. At the time of his admission he believed himself

to be suffering from chronic rheumatism, because of the painful swelling of the feet and legs and attacks of chest pain. Two years ago he began to be short of breath upon exertion and occasionally had palpitation with severe precordial pain, there was slight swelling of the feet at times after a hard day's work, occasional vertigo, and increasing muscular weakness. For several months he had been almost wholly disabled, and even in idleness his trouble steadily progressed from bad to worse.

Upon admission, October 17, he presented a most pitiable appearance, and seemed almost moribund. His pulse was very rapid, could be counted only with difficulty, and was feeble, irregular, intermittent, and unequal.

General inspection showed extreme cyanosis of the face and lips. His conjunctivæ were injected, his breathing labored and gasping. The feet, ankles, legs, and thighs up to Poupart's ligament were the seat of extreme soft œdema.

Orthopnoea was not present. The intense grade of dyspnoea caused profuse sweating at intervals, and the skin generally was clammy and cold. The abdomen appeared normal save for a marked pulsation at the epigastrium. Interrogation of the gastro-intestinal tract showed only a gastric catarrh, while the liver was considerably enlarged and tender, and the spleen passed by a trifle the costo-articular line. The urine was highly characteristic, being dark and turbid from the presence of urates, of a high specific gravity, containing albumen and an occasional hyaline cast. The total amount was considerably reduced. Aside from vertigo the nervous system was normal. The muscles were large and firm.

An examination of the chest showed forced and rapid breathing, pulsation of the external jugulars, imperfect expansion, and a curious wave of pulsation extending from the second pulmonary cartilage to a point of maximum impulse in the mid-axillary line.

Palpation yielded a distinct thrill at the point of maximum impulse or just within it, and we found that this thrill stopped abruptly with the impulse and was lost to palpation just within the apex-beat. Now, as the apex-beat was synchronous with the first sound, we could at once almost positively diagnose a mitral stenosis as being practically the only lesion accompanied by a presystolic thrill limited to the apex. The thrill was vibratory or purring in character, and palpation further yielded the peculiar undulatory wave of a weakened and laboring ventricle.

I pointed out at that time the difference between the strong heaving

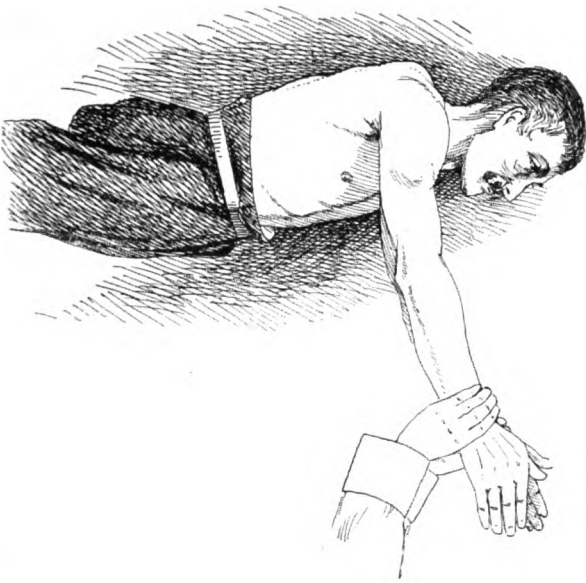


FIG. 1.—Arms carried outward; movement resisted by pressure on dorsal surface of wrist and hand. Reverse movement resisted by similar pressure on palmar surface.

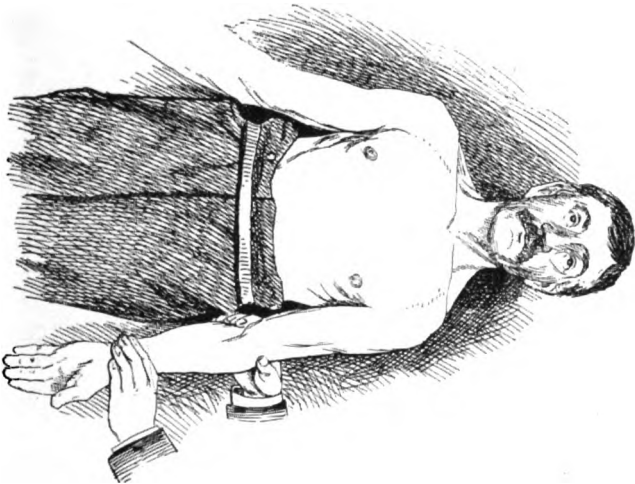


FIG. 2.—Flexion of forearm, palm front; resisted by pressure at wrist, palmar surface. Opposite movement of extension resisted by pressure upon dorsal surface of wrist.

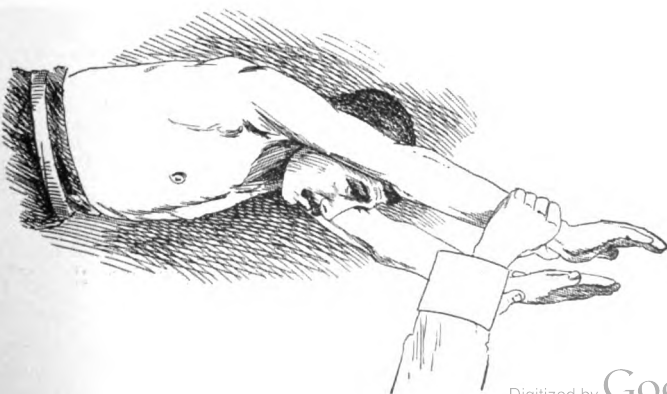


FIG. 3.—Arms at the side, palm to front, are raised vertically till thumbs touch; resisted by pressure over radial surface of wrist. Reverse movement resisted by pressure upon ulnar surface.

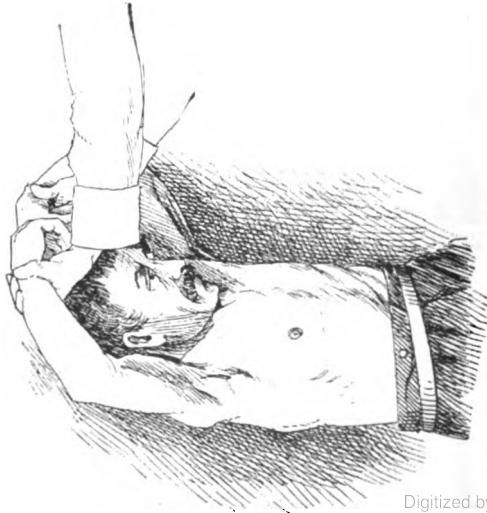


FIG. 4.—Hands semiflexed. second phalanges opposed. arms raised to vertex. This and opposite movement resisted as shown in plate.

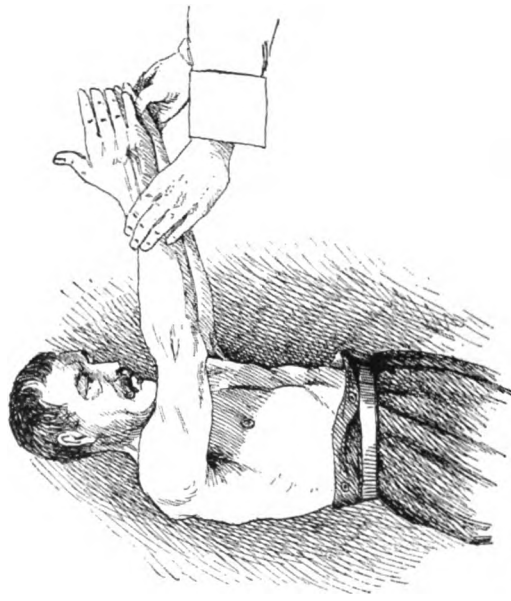


FIG. 5.—Arms at side, palm to thigh, are carried forward and upward to vertical; resistance to radial surface of wrist. Reverse movement resisted by pressure upon ulnar surface of wrist.

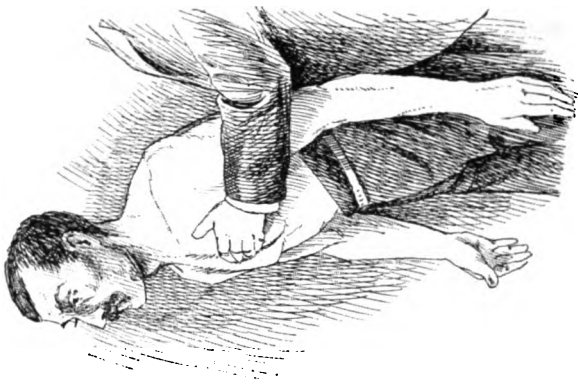


FIG. 6.—Anterior flexion of trunk; resisted by hand applied to upper chest. Reverse movement resisted by hand over seventh cervical spine.

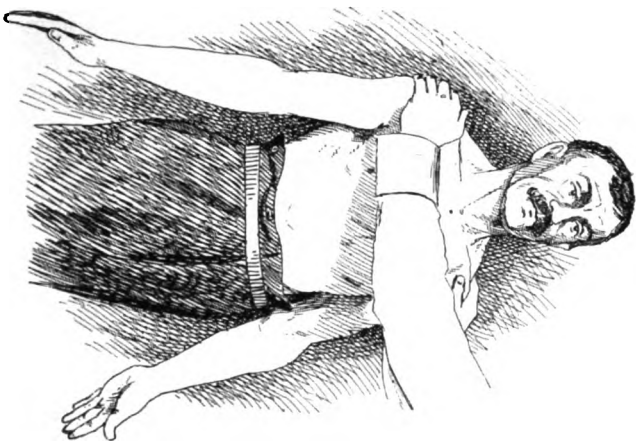


FIG. 7.—Rotation of trunk: resisting hand over anterior surface of advancing shoulder, other hand over receding shoulder. Reverse movement suggests itself.



FIG. 8.—Lateral flexion of trunk: resisting hand over axillary region of advancing side, other hand at waist line. Reverse movement the same.

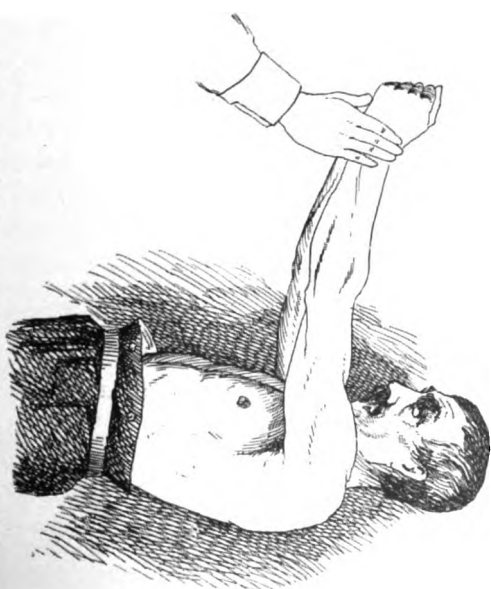


FIG. 9.—Same as FIG. 1, except that fists are firmly clinched.

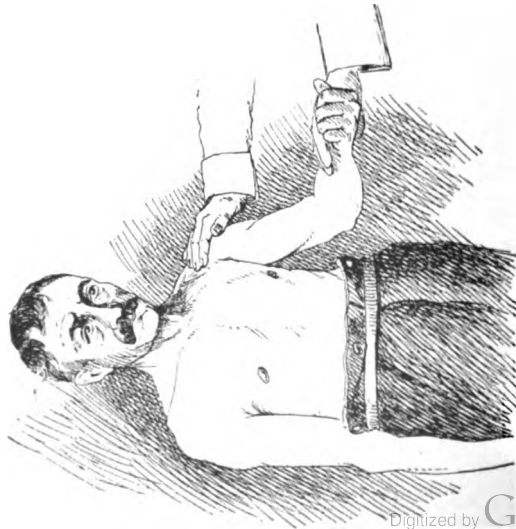


FIG. 10.—Same as Fig. 2, but with clinched fist.



FIG. 11.—Arm describes a circle upward and backward; palmar surface of hand rests against thigh at commencement of movement, but is turned outward when vertical is reached and arm passes backward.

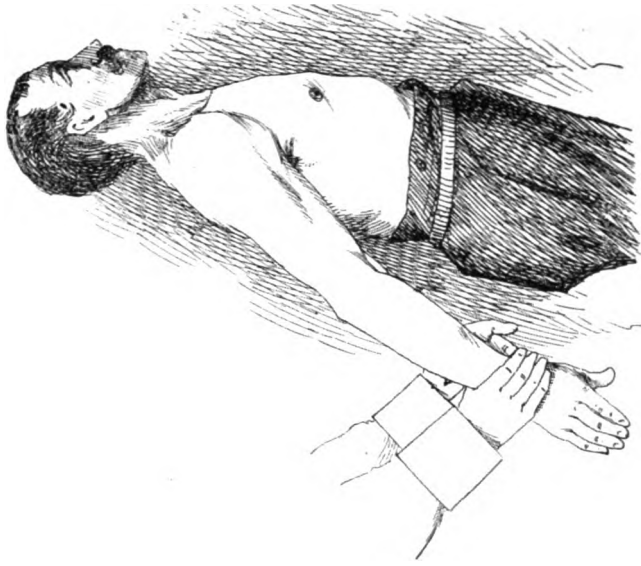


FIG. 12.—Arms extended, palms to thighs, carried upward and backward; resistance applied to ulnar aspect of wrists. Reverse movement suggests itself.

impulse of hypertrophy and the peculiar wavy "flopping" impulse of dilatation. It is essential that you should recognize by palpation the marked difference in the two beats, and by a little practice you may readily make a fairly accurate estimate of the condition of the ventricles, and thus be greatly aided in your prognosis and treatment. At present you get the impression of a strongly acting yet somewhat inadequate heart. Hypertrophy and dilatation here coexist, and the former is again asserting itself and restoring compensation,—i.e., the proper balance of the circulation.

Percussion made to determine the relative and absolute cardiac dulness gave evidence of a huge heart with both right and left chambers dilated to an extreme degree. Superficial dulness not only passed the left sternal line but was carried far beyond the right margin, as shown by the lines now traced upon the chest, and thus the area of absolute dulness formed a great triangle whose base lay to the right of the sternum and the apex at the mid-axillary line.

Auscultation showed three distinct murmurs, which we will now analyze.

First. A loud rumbling murmur which preceded and ran into a flapping and accentuated first sound. This murmur, which still exists, was heard best just within the apex and was but slightly transmitted inward; *light stethoscopic pressure best demonstrated it, while any considerable pressure nearly obliterated it.*

Second. A systolic blowing murmur heard best at the apex and transmitted through the axilla to the scapular angle. This murmur (still present) *was best heard when a little pressure was made with the stethoscope*, and was lost a few centimetres to the right of the nipple line.

Third. As we approached the edge of the sternum, in the fourth interspace, we heard a soft, systolic murmur, which could be followed downward to the ensiform cartilage, and was lost at the upper border of the left fourth rib.

An examination of the lungs showed an extreme degree of congestion. What then were the conditions present?

There are three chief points always to be considered in interpreting heart murmurs:

- (a) Point of maximum intensity of the murmur.
- (b) Its direction and extent of transmission.
- (c) Its position in the cardiac cycle.

We must also note one more point,—viz., the quality and pitch of the murmur itself. Bear ever clearly in mind the events occurring in

a cardiac cycle. We may say roughly that with the first sound (systolic) our two lower chambers are contracting upon the blood which has poured into them from above; the aortic and pulmonary gate-ways are opened, the auriculo-ventricular (mitral and tricuspid) are briskly closed. Any systolic murmur of valvular origin is therefore due either to stenosis (obstruction) of the blood-current at the aortic or pulmonary valves or to a back-flow through the auriculo-ventricular (mitral and tricuspid) orifices.

As our left heart is the hard-working side, we will naturally look to that in nine out of ten cases as the point of origin of our murmur, and ask whether it is due to mitral regurgitation or to aortic stenosis. If it be *mitral* systolic (regurgitation) then (a) its point of maximum intensity is the apex; (b) its transmission is to the left through the axilla to the back. If it be *aortic* systolic (stenosis) its point of maximum intensity is at the second right cartilage where the arch of the vessel approaches the sternal edge, and it will be transmitted to the great vessels of the neck. We can hardly confuse these two murmurs, and, moreover, the systolic mitral is *usually* somewhat soft and blowing, the aortic harsh and rasping.

So much for our left heart. We have now to consider the right. Is it pulmonary stenosis? We may disregard this lesion by reason of its rarity, and are left with the tricuspid systolic (regurgitant),—(a) with point of maximum intensity at lower sternum and ensiform, and (b) heard but a short distance from the left or right sternal margins and ensiform, uniformly low pitched, soft, and blowing in character.

In this case two of the three murmurs present were systolic, both were *unheard in the aortic or pulmonary area*, throwing these orifices out of the field at once. One was best heard at the apex, was well transmitted through the axilla to the scapular angle, of moderately high pitch, and blowing in quality (evidently mitral regurgitation). The other, soft and low pitched, was heard only over the left sternal margin below the level of the upper margin of the third cartilage, and ceased abruptly as we moved to the left. There was a point between the apex and sternum where neither murmur was heard, and we were justified in assuming that the murmurs were separate and distinct, each having *its own point of maximum intensity, definite area of transmission, and difference in pitch*, and being alike only in time. They were, therefore, due to mitral and tricuspid regurgitation. So much for the systolic murmurs; now for that third murmur, apical diastolic or presystolic, which we held responsible for the decided thrill felt at the apex. Here we must ask what occurs with the second sound?

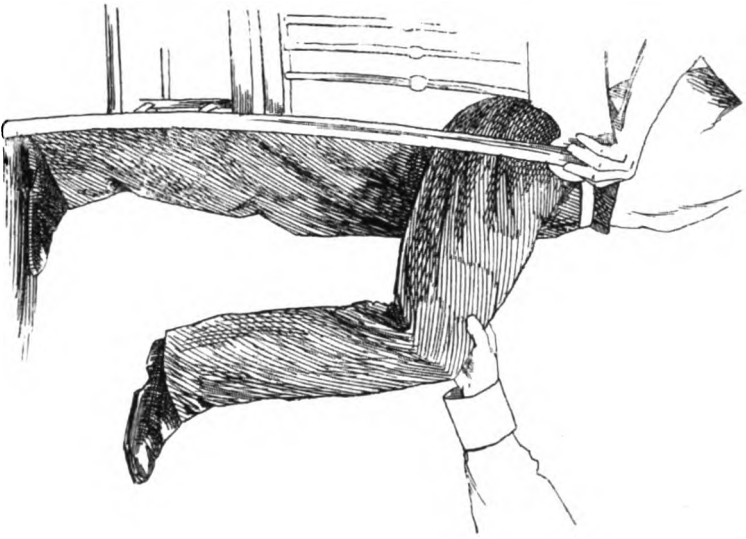


FIG. 13.—Flexion of thigh on trunk : resisted by pressure above knee. Reverse movement is resisted by upward pressure on lower surface of thigh (under aspect).

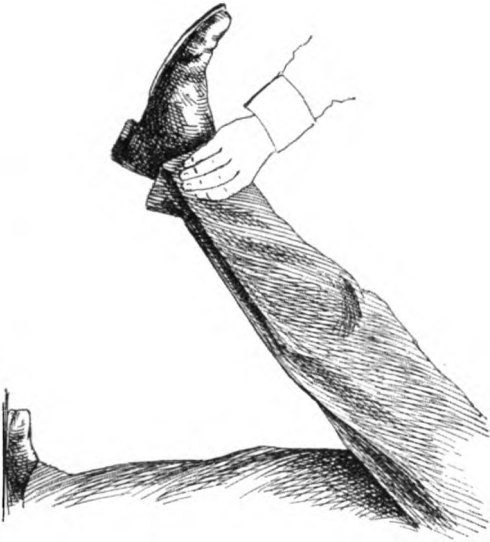


FIG. 14.—Extended lower extremity carried forward : resisted by pressure over front of ankle. Reversed by carrying backward to extreme limit, returning then to position : resistance posteriorly over ankle.



FIG. 15.—Flexion of leg on thigh : resisting hand over ankle posteriorly. Reverse movement shown in Fig. 16.

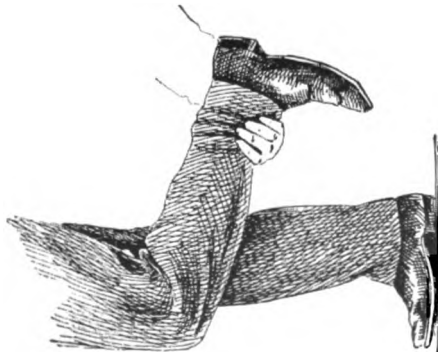


Fig. 16.—Reverse movement of Fig. 15.

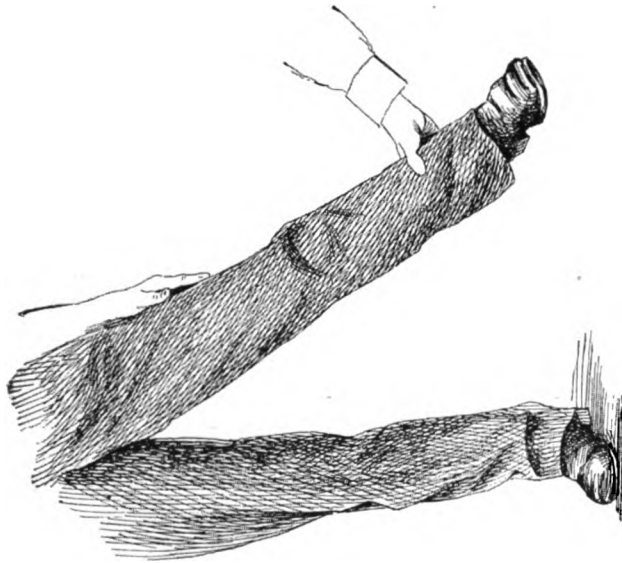


Fig. 17.—Extended extremity carried outward; resisting hand above ankle. Reverse movement suggests itself.

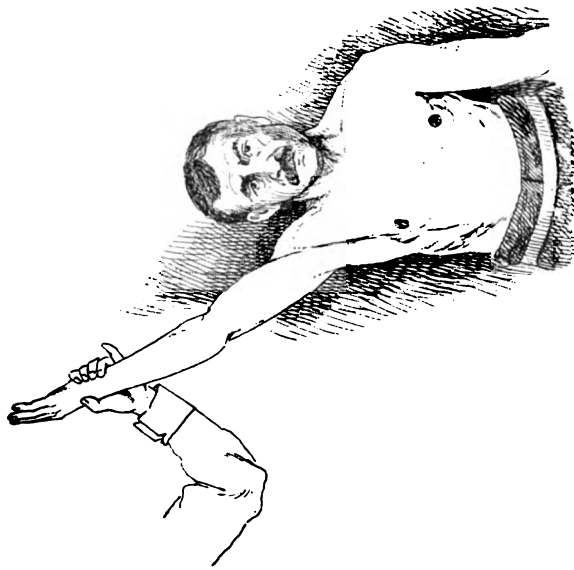


Fig. 18.—Rotation at shoulder joint forward and backward. Arms should be more nearly horizontal than shown here.

The second sound initiates diastole, the period of ventricular relaxation, during which the aortic and pulmonary orifices are closed while the auriculo-ventricular are open and the blood is pouring down from above to fill the ventricle for systole. Just as this event is imminent the auricles contract and urge with added velocity the blood from the auricle to the ventricle. What murmur can occur, then, in diastole or presystole? One for each orifice, of course (our systolics reversed), hence there may exist obstruction in the mitral or tricuspid valves or regurgitation through the aortic or pulmonary semilunars. We did not need to concern ourselves here with the right heart, but looked again to the harder-worked left heart. Was it aortic regurgitation or mitral stenosis? Assuredly the latter, because, first, the point of maximum intensity was apical, not aortic and sternal; secondly, the transmission was limited to a small area over the left ventricle; thirdly, the time of the murmur was distinctly presystolic rather than diastolic, thanks to our presystolic auricular contraction, which forced the blood through the narrowed orifice just before systole. Sometimes this murmur sounds diastolic purely, but even then there need be no confusion if the first two points are borne in mind; fourthly, there is no other murmur which could simulate this typical mitral presystolic rumble with the flapping foetal first sound.

Thus we interpreted our murmurs and found a search-light to help us to a further understanding of the case. Now let us fit our murmurs and their causes to the patient's general condition.

You remember the old dictum in valvular disease,—*i.e.*, "that the bad effects pass against the stream," a good general rule, and like all good rules admitting occasional exceptions. Let us thus trace backward the effects of the lesions and see how they fit the case.

Mitral stenosis and regurgitation mean a dilated left auricle, for the auricular outlet is narrowed during diastole, and during systole the leaky mitral allows a back-flow into the overloaded chamber. An overfilled left auricle means overfilled pulmonary veins, congestion of the lungs, and marked obstruction in the pulmonary circuit. We find evidence of this increased pulmonary tension in the sharp, snappy second sound over the pulmonary valve, for the pulmonary artery has caught the strain, and the valve is slammed to with violence by the increased back pressure. As this strain meets the right ventricle, that chamber hypertrophies and overacts, the pulmonary vessels are caught between two opposing forces, and pulmonary apoplexy is imminent, but nature has left a weak spot in the circuit. Three-leaved valves are weaker than two-leaved ones. The tricuspid valve yields to the

strain, a safety-valve leakage occurs, and tricuspid regurgitation is established, which is manifested to us by the soft systolic murmur over the sternum below, and later by pulsating jugulars above. But we must go further still ; the leakage through our tricuspid means an over-filled auricle and a damming up of the blood in the systemic veins ; hence the congested conjunctivæ, cyanosis, and œdema of the extremities. The obstruction in the portal system accounts for our enlarged and tender liver, and gastric catarrh, while in the renal veins it brings about the passive congestion of the kidneys which gives the albuminous, scanty, and concentrated urine referred to early in the case history. In addition to this, the emptying of the coronary veins into the right auricle is interfered with, and the deficient blood-supply of the heart adds to the danger by furthering degenerative changes in the heart muscle. Thus we have rounded out our diagnosis. Our patient had an enormously dilated heart with mitral stenosis and regurgitation, a secondary tricuspid leakage, and general visceral congestion.

Etiology.—Please note that we have no history of previous illness leading to the present disease, but that the element of heredity is marked, and that he has worshipped at the shrine of both Vulcan and Bacchus. We shall see many other cases where Venus and Bacchus have been factors in the production of degenerative diseases of the vascular system. Hereditary predisposition in these cases is in my opinion quite as marked as in tuberculosis, and rheumatism, syphilis, physical strain, and excessive use of alcohol furnish the histories of most of the cases admitted to a hospital of this sort. In our private cases we find the worship of Mammon, 'that endless and exhausting pursuit of riches, with its intense concentration, broken rest, irregular eating, and almost constant vascular overstrain, to be a most potent causative factor, and there is no question that the lack of exercise, the lamentable want of draught for our bodily furnace, sends to the circulation a mass of clinkers, which keep up a continual irritation of the circulatory system, with resulting high tension and heart strain. This need of exercise is a fact overlooked by many in the treatment of a diseased heart, and is one of the fundamental principles of treatment. In fact, the rational combination of the opposites, rest and exercise, forms the best of *all* methods of treatment.

We have described to you the condition of this man upon admission, and you may see for yourselves the contrast between then and now. His cyanosis has disappeared, the breathing is easy and free, all œdema has disappeared from the limbs, and his heart beats 85 to the minute with occasional intermission but good volume. His appetite

is good, his liver, spleen, stomach, and kidneys are practically normal, and his lungs are perfectly clear.

More remarkable, however, is the change in his cardiac condition. The apex-beat is strong and heaving, the maximum impulse but an inch beyond the nipple line. The superficial area is about one-fourth what it was upon admission, as you may readily see from our percussion tracings. The pulsation of the jugulars has ceased, and no murmur is to be heard in the tricuspid area. The presystolic thrill and murmur are still present, however, and we have also the mitral systolic.

Our patient is going to get up and go out in a few weeks, with his circulatory balance restored, able to get about and live quietly for a considerable period, if he be careful to avoid physical strain and indiscretions in other directions.

The treatment pursued was that combination of saline baths, rest, and resisted movements, which bears the name of the brothers August and Theodor Schott, of Bad-Nauheim, who have long preached the truth to deaf or unheeding ears, and only within the past two or three years have begun to receive credit for their most valuable and interesting work.

The treatment advised by them and followed out in a modified form in this case is briefly summed up as follows; lack of time forbids full reference to details or the discussion of the theory upon which it is based, but I advise you all to read carefully the very excellent and valuable little monograph of Dr. W. Bezly Thorne, to which I am chiefly indebted for the description which follows:

At Nauheim there are certain springs used in this treatment which, by the temperature of their waters and their natural saline and gaseous constituents, form an ideal series of baths, not, of course, available to us; but Dr. Schott tells us that the waters of Nauheim enjoy no monopoly of healing power, and generously insists that artificial baths properly used will produce exactly similar effects.

If we examine the analyses of the Nauheim waters we find that their chief constituents are sodium and calcium chloride and free carbonic acid gas, and that their temperature varies from 95.54° F. to 81.68° F., the higher temperature being that of the spring most commonly used. We use a bath of 90° to 92° F., containing from one to three per cent. of salt (ten to thirty grains to the litre). Calcium chloride may be added in the proportion of two-tenths to three-tenths per cent., and for its stimulating property we may generate artificially our carbonic acid gas, prepared after the formulæ of Bezly Thorne.

Mild: $\frac{1}{2}$ pound NaHCO_3 , $\frac{1}{4}$ pound HCl (twenty-five per cent.).
Medium: 1 pound NaHCO_3 , $1\frac{1}{2}$ pounds HCl (twenty-five per cent.).
Strong: 2 pounds NaHCO_3 , 3 pounds HCl (twenty-five per cent.).

Five minutes' time will suffice for the preparation of the bath, the salts being first dissolved, and the HCl slowly and evenly distributed over the surface of the bath by inverting the open bottle with its mouth just below the surface. The patient remains immersed for a period varying from three to fifteen minutes, the shorter period sufficing for the first baths and the last representing probably the safe maximum. After the bath the patient rests recumbent for at least one hour. The baths are discontinued every third, fourth, or fifth day,—i.e., not more than four are to be taken in succession. In the case of our patient, who was of course bedridden, Dr. Arslanides, our house physician, had him carried to and from the bath, permitting no voluntary movement of any kind. There is great danger of chilling the patients in carrying them to and from the bath, and personal supervision should be the rule.

Now, without attempting to develop the theory of our treatment, we will speak of the visible effect. The patient when first placed in the bath experiences a feeling of oppression and dyspnoea, which is quickly succeeded by a feeling of well-being and exhilaration, his pulse becomes slowed by many beats and of improved tension, the color of the skin and mucous membrane brightens, and the nails soon lose their dusky tint. There is no doubt as to the occurrence of these good effects, and we see plainly that several indications are met: 1, the peripheral circulation is freed; 2, venous stagnation is relieved; 3, the heart strain and poisoning of the heart muscle are lessened and dilatation is markedly diminished. Of the last proposition we may easily satisfy ourselves by making tracings of the heart before and after the baths, when we shall find the right and left cardiac borders to have receded several centimetres, the apex-beat will be farther inward and of a heaving quality, which suggests added strength for our ventricular wall. This good effect is not evanescent, and we will find each day an advance over the day before. Not content with this the brothers Schott have advised, as an adjunct to the treatment or for use alone in cases where the bath is unavailable, some very simple but wonder-working exercises. These are the so-called resisted movements,—i.e., certain movements made by the patient against gentle resistance offered by the attendant or physician.

The movements are extremely simple, but a knowledge of their underlying principle is indispensable to their intelligent use.

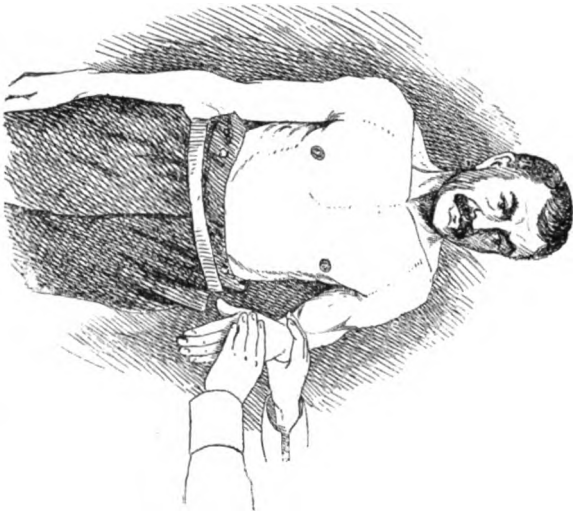


FIG. 19.—Extension of hand on forearm; resisting hand over dorsal surface. Flexion resisted by hand applied to palm.



FIG. 20.—Flexion and extension of foot; resistance as indicated.

Remember that they are intended to produce the beneficial result of exercise without fatigue, and you have the key-note of success, and can appreciate the scrupulous care necessary in using them in our chronic heart cases. There are nineteen *primary* movements so skilfully and scientifically devised as with their reverse or secondary movements to exercise nearly every muscle group in the body, and their visible effect is almost precisely that of the baths, but there is an additional factor of great advantage to our patient, for not only is his heart slowed, his pulse full, his peripheral circulation free, but we know that each muscular movement has brought about combustion of waste and hastened the current of sewerage towards its proper channel of elimination ; but again remember that there must be no fatigue. The nicest judgment and most painstaking skill are required, and increase of the pulse-rate, pallor, or evidence of dyspnoea warns us to stop at once. The amount of resistance, rest intervals, and number of movements well borne by the patient must be left to the operator's good sense. Furthermore, (a) the clothing must be loose ; (b) each movement should be performed deliberately and smoothly ; (c) the breathing must be deliberate and regular ; (d) the resistance should be varied according to the strength of the patient and the effect produced ; and (e) no movement should be repeated in the same limb or muscle group. Thus simple and rational are the principles of this treatment.

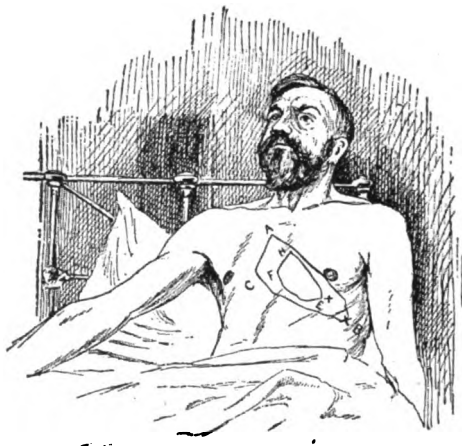
In this case the effect upon the heart itself has been marvellous (see Fig. 21) : the old area of absolute dulness (*BAC*) has shrunk to less than a third of its former area, being still, however (*EHF*), somewhat in excess of normal. His apex-beat has receded nearly to the nipple line, and our tricuspid murmur, pulsating jugulars, cyanosis, congested liver, spleen, stomach, and kidneys are now relieved. The pulse is comparatively regular and equal, the impulse strong and heaving. In other words, we have put this man where he was two years ago, when his hypertrophy gave place to rapid dilatation. He is not well, never can be, will never again do heavy work, but his life is extended for a considerable period, and he is in comparative comfort. He thoroughly enjoys the bath, and, needless to say, believes in its efficacy.

Many theories more or less elaborate are advanced to explain the effect of this line of treatment, but whatever may be the exact means through which this beneficial result is obtained the chief effect is probably the dilatation of peripheral vessels and consequent relief of the ventricles, which can contract more leisurely and by consequence do better work. This in time means relief from venous congestion, and

this is the difference between life and death. The stagnant fluid which is filled with the products of suboxidation is hurried onward to be purified and receive the oxygen for burning waste and nourishing tissue. The poisoned brain again becomes clear. The sodden connective tissues are drained. The congested liver and gastric mucous membrane become clean and active, and the kidneys are put in order to receive and carry away the sewerage which now comes in great quantities from the revived tissues.

I have shown you an extreme case, but you must bear in mind that this treatment is especially applicable to the minor conditions of dilatation, and that a vast amount of benefit is obtained in such cases; it may generally, I think, after a certain time be combined with walking

FIG. 21.



Frank G. *B A C*, area of superficial cardiac dulness at time of admission to hospital; *E H F*, same area after eight weeks' treatment; *X* indicates area of maximum impulse.

exercises with decided advantage. In severe cases of long standing too much must not be promised. The treatment in such cases should be combined with absolute rest in bed and continued over a long period, with a gradual resumption of bodily activity. Arterio-sclerosis and aneurism positively contraindicate the employment of the baths, and it will probably be found that aortic lesions are less benefited than those of the mitral orifice. Various other rules for guidance in their application will no doubt be developed as the result of a wider experience with the baths, and their limitations will be more clearly defined as their use becomes more general. As regards the general management of these cases, aside from the question of drugs, we may say that they

are best put upon a light mixed diet, cutting off the tuberous vegetables for the most part, giving them meat and fish freely, *but not to excess*, and forbidding all sweets, pastries, fried foods, and made dishes of any kind. They should, I think, be encouraged to drink a great deal of water. This is well taken in the early morning on an empty stomach, two or more glasses at intervals of twenty minutes. Again in late forenoon, late afternoon, and at bedtime. This will furnish a means of flushing the sewers, sweeping away and diluting the poisonous products of suboxidation, and so help to prevent contraction of peripheral vessels and aid in maintaining a lowered blood-pressure. All channels of elimination are to be considered and appropriately looked after, and, gentlemen, I believe you will find that chronic diseases of the heart or blood-vessels are among the most satisfactory you have to treat, for modern cardiac therapeutics and exact diagnosis enable us to promise and perform much more than would have been considered possible a generation ago.

THE TREATMENT OF ECZEMA.

CLINICAL LECTURE DELIVERED AT THE POLYCLINIC HOSPITAL, PHILADELPHIA.

BY J. ABBOTT CANTRELL, M.D.,

Professor of Diseases of the Skin in the Philadelphia Polyclinic and College for Graduates in Medicine; Dermatologist to the Philadelphia Hospital and to the Southern Dispensary, Philadelphia.

GENTLEMEN,—The successful treatment of eczema must depend upon the observance of certain rules, and these must be governed by each individual case presenting itself. Naturally, before commencing the treatment, we must be reasonably sure that we have made a correct diagnosis of the case before us. Thus, the erythematous variety will be distinguished from acne rosacea by the cold rather than the warm feeling of the part, its occurrence being first witnessed at or near adolescence or at any age in those who are alcoholics, there being no thickening or infiltration as seen in eczema, itching as well being a constant symptom of the latter disease. Erysipelas will be recognized by its being acute rather than chronic, there being some rise of temperature accompanied with malaise. Alike, in scarlatina, we have malaise and fever connected with symptoms of general disorder. Herpes zoster will show certain peculiarities differentiating it from the vesicular variety, such as the grouping of the lesions, the peculiar halo of redness, unlikelihood of breaking or crusting, and their usual manner of following nerve-tracts. In impetigo contagiosa the character of the crust and the liability to its extension are marks of difference. More surface is usually invaded in scabies, it not being localized as vesicular eczema often is. While the papular variety may resemble lichen planus, it is never so chronic; its lesions are usually seen upon the legs, while those of the latter disease rarely attack portions other than the hands. The scaling of lichen ruber differs from the blood-crust of eczema, severe itching in the disease before us not being a grave disease like lichen. The lesions of lupus vulgaris are more likely to be large tubercles rather than papules, and they are prone to affect the face. Urti-

caria is decidedly acute ; it is likely to give the symptoms of the ingestion of some drug, and there may be some œdema of the face. In the pustular we have lesions attacking the beard and scalp, in which locality we rarely find acne. Sycosis is usually of long standing, and does not affect parts other than the hairy portion of the face, while eczema is acute, and is usually found on other localities. Erythematous lupus does not show the scaling of the squamous variety, although it does appear more red, and is likely to be circumscribed and raised above the surrounding surface. Eczema rubrum can be thoroughly differentiated when everything is taken into consideration.

A careful examination as to the history of infection—the remains of a recent initial lesion, the involvement of the glands, there being no itching, no moisture or infiltration, the history of snuffles and the appearance of the condition around the mouth and anus of a child—suffices to place syphilis aside from a diagnostic point ; and after proving conclusively to our minds that we have a case of eczema before us for treatment, we must take into consideration the appearance of the condition, the character of the lesion,—whether it appears in the young or in the elderly,—the natural softness, pliability and thinness of the skin, or whether this organ is a thick, tough, and roughened membrane,—the point of attack,—is it upon the thin or the thick portion of the natural skin ? does it affect the flexures, or is it on the more exposed portions of the body ? is the patient a manual- or a mind-worker ? what are his usual circumstances in life ? does his occupation require a sedentary or an erect posture ?—if either, is it an exposed locality, or is the temperature an even one ?—what are his daily habits ? was he much of a walker ? was he a hard or a moderate drinker, or does he not drink at all ? has he any affection that would naturally produce an effect upon the skin, such as digestive disturbances ? etc.

The cause may be some internal derangement, such as affections of the intestinal canal or of the kidneys, their secretions or a portion of the organ itself ; or the secretions may not have been acting properly, or are not removed as they should be ; or it may be excited by some trade influence, such as bakers, grocers, plumbers ; those who may be exposed to the inclement weather, or those who may be obliged to work in acids or alkalis ; or where the same influences operate to produce this condition in the female, such as those who may be in constant contact with a heated stove or daily use of the wash-tub, or still others working as chambermaids. After giving proper attention to any or all of these exciting causes, it is naturally our duty to protect, relieve,

and cure the manifestations witnessed in connection with these derangements.

In choosing a course of treatment we are to determine whether the disease is acute or chronic, because the manner of treating the case will certainly differ if we have a highly-inflamed part or one that is apparently not affected to much of a degree. It must also be remembered that the remedy which affects one case will not always be beneficial in another, but often deleterious.

Where there is much crusting or the part is otherwise immovable from the condition present, it may be advisable to use some emollient dressing, such as the sweet or some other bland oil, which may be applied directly to the part and kept very moist, or it may be used upon strips of lint, and afterwards bandaged, and thus kept moist. Care must also be given here lest irritation take place, even from one of these mild drugs.

In other cases an ordinary starch or a bran poultice will be the better dressing. There may be an occasion for the use of some dusting powder, as, for instance, in the erythematous, vesicular, or papular varieties, or where an intertrigo has supervened, and here one of the following will be found of service: rice-flour, corn-starch, fullers' earth, kaolin, or even the ordinary lycopodium; these give a soothing effect to the part, and often greatly assist in the cure, frequently even curing without other assistance.

It is advisable for the patient to use hot fomentations with the addition of a small amount of boric acid dissolved therein. This will assist in keeping the part free from being irritated by the water, although one may at times receive decided benefit from certain of the medicated baths, and, if advised properly, a sulphur bath will be found beneficial, and this may also be said of some of the other medicated baths; or we may give the sufferer a bath with the addition of a small quantity of bran. This often acts as a very soothing application, and relieves the inflammatory character of the condition to a great extent. Other watery fomentations are the *lotio nigra* of the *Pharmacopœia*, and a saturated solution of boric acid or benzoic acid in water or alcohol, or we may even use calamine powder (impure carbonate of zinc), or use may be made of the bicarbonate of soda in solution. In the use of ointments care must be taken in their preparation. It must be seen that they are carefully rubbed together, and that there are no gritty parts, or else they will have a tendency to make the condition worse than when first seen by you, and it may even be necessary to have all the ingredients well pulverized before adding to the ointment

base, especially in those drugs which have a tendency to be coarse, and thus make a very coarse ointment. Now that we are aware of the condition in which we might find the ointment, it will be necessary to see that the base is also of the proper kind; that it is not old or rancid; that it also was properly made, and that the selection was well chosen. My impression is that the best is the zinc oxide ointment, especially where there is an acute inflammation of the parts, or where it is better that the drug should be applied in a form that is easily absorbed. Ordinary lard or petrolatum, albolene, rose ointment, or lanolin will be found to be useful menstrua. I am in the habit of using the ointment of zinc oxide when the parts are acutely inflamed.

In eczema of an acute type our choice of remedies must be from those which have a soothing or palliative action, or, in other words, those having astringent properties. In the chronic cases we choose stimulating applications. In the erythematous variety, affecting the whole integumentary surface, care must be exercised that the selection shall produce no adverse symptom if absorbed, and there must be no idiosyncrasy to the remedy chosen. As well must care be given to the selection of remedies for the treatment of either or all of the other varieties.

Dusting powders, emollient dressings, watery solutions, or ointments, with bandages, will add to the relief and cure of the affection before us.

Dusting powders often play a very important part in the treatment of this affection, especially when the part is unduly moist, or where there is rubbing together of contiguous portions, such as in the flexures of the body, in the axillary space, and in and around the groins.

The varieties of powders to choose from are very considerable,—that is, those worthy of choice, such as boric acid, bismuth, talc, kaolin, lycopodium, fullers' earth, corn-starch, and rice-flour, and a small quantity of camphor added to any of the above when itching is a decided and complicating symptom.

Emollient dressings often have a soothing action on the part, such as any of the bland oils, as, for instance, neat's-foot oil, sweet oil, olive oil, the oil of sweet almonds. When applied to parts that are very highly inflamed these oils often take the place of other remedies, and give the patient much comfort and relief from the intolerable itching and constant desire to scratch. These applications often are useful in removing dried crusts or the *débris* from the parts, and where they may not have any decided action upon the cure of the part, they often remove the inflammation, and thus give way to treatment that will cure

the disease. Also, many skins will demand this treatment rather than any other, because they are naturally thin and pliable, and the least treatment of any kind will remove what in other cases would prove very intractable.

A watery solution may be all that is required to cause a cure, and I would advise the use of one of the following, always taking care that the manner of application is carried out in every particular, because, if it is not, it will often do more harm than good, and for that reason the patient must be instructed to follow treatment in the manner prescribed by the physician, and in no other, as it will be remembered that patients always or often think that they know more than the physician, and will follow out their way of thinking rather than the advice of the physician, and thus the treatment will often fail, and it will revert upon the physician, and not upon the patient. Therefore remember that you should be explicit in your directions, especially in this particular, and see that it is carried out just as you direct, and you will find that the result will justify what I have told you.

Of these dressings we may make use of boric acid in watery solution, but care must be taken that the water is very hot; in fact, just as hot as the patient can bear it, and the result will be much better than by using cold water, which often does more harm than good, especially in eczematous conditions. Other dressings of this sort may be chosen from the *lotio nigra* of the *Pharmacopœia*, the fluid extract of *grindelia robustæ* (3 ii to the quart of warm water), and applied very carefully,—that is, have the cloths wet with the solution and allowed to remain upon the part, and not rewet until they are entirely dry, because if you do not follow this completely, you will be confronted with a very much higher inflammation than was the accompaniment of the disease. If the part is very itchy we may get relief from the use of only hot water,—that is, just as hot as the patient can bear it, and this can be kept in contact with the part without fear of producing the harm which would result from the application of cold water alone.

Other remedies can be successfully used when the part is unusually itchy, such as carbolic acid in the proportion of one to two drachms in a pint of water, thymol one part in a thousand, bicarbonate of soda in the same proportion, or we may find good relief follow the use of camphor in small quantities.

Ointments will often be demanded, and the choice of these is from a great number of drugs, but it must be remembered that in their action they are either astringents or stimulants, and we must be careful to choose the right one for the case before us.

In the selection of unguents care must be exercised as well in the choice of base as of ingredient, and the unguent chosen should be that having the better penetrating powers, as well as somewhat of a curative action on the disease. If the case be of an acute character the ointment of zinc oxide will often assist greatly in the cure of the disease, even without the assistance of any other combination; but in many cases this good result will not be reached without some other assistance. I believe in most cases this is the base *par excellence*, but in others we are obliged to look carefully around to choose some other containing better penetrating powers, such as lanolin, which is the better where it is necessary that the drug should be quickly absorbed. Oftentimes we may receive this good benefit from the ordinary lard or petrolatum. After we have thus chosen our base we are then to add our ingredient, and as we add it we must be careful that it is well rubbed together, care being taken that there are no particles left which would in any way produce inflammatory conditions of the part which we are called upon to treat. I think the better plan would be that the ingredient chosen should be well powdered before being added to the ointment. This seems to be a minor point in the manufacture of all preparations; therefore I caution you most particularly in this matter. If you do not give attention to this point, you may be confronted with a much worse condition than the original affection, or if not, you may wonder why the ointment will not have the same good effect in one case that it had in another. In acute cases our choice of remedies will be from those having astringent properties, and of this class mention may be made of calomel, resorcin, acetanilide, ichthyol, or some other form of sulphur, salicylic acid, when used in very small proportions, or possibly one of the tar preparations.

Having made our choice from one of the foregoing, we wish to know in what proportion it is the better for the case presenting itself. In a mild case of either the vesicular or pustular varieties we would make choice of possibly calomel or resorcin, and my usual plan is to add the smallest quantity until perfectly aware how the case is going to act in the presence of this drug; therefore I would advise that you take the following:

R Calomel or resorcin, gr. x;
Oxide of zinc ointment, $\frac{3}{4}$ ss.—M.

Or, finding that this is not acting properly, and not giving you as quick a cure as you would like, the ingredients may be increased to even twenty or more grains, care being taken that you do not give too much

until you are perfectly acquainted with the case before you. In using acetanilide, ichthyol, the sulphur preparation, such as the oil of cade, oil of birch, or even the liquid tar, you must give just the same attention to the minor details as in the use of the former drugs. Acetanilide may be given in the proportion of from ten to thirty grains to the half-ounce of ointment; ichthyol and the sulphurous preparations in quantities ranging from fifteen grains to a drachm to the ounce, and the same of the tar preparations; but do not forget that sometimes the tar preparations will not be well borne by the patient because of an idiosyncrasy to their use.

In the mild cases of either the erythematous or other varieties, such as eczema rubrum and eczema squamosum, we make use of either one of the sulphur preparations or of the ichthyol, in the proportion of from one-half to one drachm to the ounce, and if this is not found sufficient, you may increase the drug to some extent. In this class of cases resorcin may be found very beneficial, and I would advise that it be used in the quantity of from ten to twenty grains to the ounce of ointment base; but I do not think it would be advisable to use it much stronger than this unless you are thoroughly acquainted with your case. If you are not careful some inflammation may be produced by its misuse. I give you this because many cases will be greatly benefited by it.

In the more chronic cases you will be obliged to use somewhat more stimulating remedies, and in those of long standing the stronger ones will be required. Of this class we may mention salicylic acid in quantities of ten to twenty grains to the ounce of ointment, and this may be applied freely without any danger if the case is carefully watched, as all cases should be. Salol in about the same proportion may give the desired relief. But it must also be remembered that often in the most chronic cases the mildest remedies will give more relief than the stronger ones, and I would advise you always to give mild drugs the preference in all your cases, but finding that the relief is not forthcoming, then, and then only, would I resort to those of a stronger nature. In your after-life I caution you not to be too anxious to cure your cases quickly, because you may do more harm in this way than you would by simply biding your time. Therefore, go easily, and get a better result than you otherwise would.

The careful application of bandages will greatly assist in the cure, and generally give decided relief to the suffering patient.

THE TREATMENT OF RETRO-DISPLACEMENTS OF THE UTERUS.

CLINICAL LECTURE DELIVERED AT THE BALTIMORE MEDICAL COLLEGE.

BY T. A. ASHBY, M.D.,

Professor of Diseases of Women and Children in the Baltimore Medical College.

GENTLEMEN,—A great deal has been said and written on the treatment of posterior displacements of the uterus. It might appear on first sight that the subject had been worn threadbare. Nevertheless, a great deal of work has been done recently, and much still remains to be done before the management of these conditions will reach a perfect state.

There are few conditions of the intrapelvic organs which give rise to so great disturbances and which resist successful treatment to the same extent as the retro-displaced uterus. We may consider this subject under the following heads :

1. The congenital form ; 2, the acquired form without adhesions ; 3, the acquired varieties associated with inflammatory conditions of the tubes and ovaries ; and, 4, those forms in which the tubes and ovaries are not involved to any extent, but where the uterus is firmly attached to the pelvic peritoneum by firm bands of adhesions.

The normal position of the uterus is one of slight anterior flexion, the body of the uterus corresponding with the axis of the superior strait.

Between the normal and abnormal positions a wide range of position is possible without serious disturbance. The uterus has a wide range of mobility, and will change its position with inspiration and expiration, or as it is pressed forward or backward by the contents of the rectum or bladder.

I have frequently met with extreme degrees of anterior and posterior flexion and version without the slightest discomfort being experienced by the patient, and where I had reason to assume that these positions were of long standing.

In determining the pathological significance of a version or flexion the history and symptoms of the case formulate the law. As a rule, displacements slowly acquired are far less distressing in their influences than those of a more acute nature. The reasons for this are not difficult to assign. In the first instance the blood-vessels have undergone gradual modification, and vascular disturbances are less pronounced, while in the latter disturbances of the circulation play the most prominent rôle in the causation of pains and other symptoms. The mechanical effects of displacement cause a minor train of symptoms more easily managed than those due to circulatory disturbances. In my experience the retro-displacements are far less frequent as a congenital vice than the anterior varieties, though this observation has not been made by all observers. I do not propose to enter into the etiology of this subject. The congenital varieties are found now and then in young unmarried women, and persist after married life should sterility not disappear. Where the displacement is extreme, dysmenorrhœa, back-ache, constipation, and sterility are the usual symptoms observed. I have met with a few of these forms where the symptoms were of a very distressing character, and where local treatment was necessary, but I have never seen a case where relief did not follow judicious treatment.

The acquired varieties in young girls and women who have not borne children may be traced to falls and blows, to tight lacing and imprudent dressing, to disturbances of menstruation, and occasionally to attacks of intrapelvic inflammation. The degree of displacement will usually determine the severity of the symptoms. Many women fail to seek relief at the time the displacement is acquired, and the case may not come under observation until the local condition of the uterus has been materially modified by the vascular and nutritive changes in the uterus itself and the surrounding tissues. We find these cases in every degree of severity. Many of them are easily relieved by rest in bed, by support of the uterus, and by the use of depleting agents. A few persist as chronic conditions, and give no little trouble before they can be treated successfully. Acquired displacements observed in the woman who has borne children may be traced to causes similar to those named, but they will more frequently be found associated with an arrest of involution of the uterus following abortion or labor at full term. The uterine walls are weakened by an arrest of the process of involution, and a large and heavy uterus tumbles over against the sacrum. Once caught in this position it remains there indefinitely unless corrected by treatment or by a subsequent pregnancy. These

cases are not of infrequent occurrence, and when met with the relation of cause and effect is easily established. They resist treatment obstinately. If the uterus is perfectly movable in the pelvis, rest in bed and support with the tampon or pessary are very serviceable, but where the involution of the uterus has been arrested and we have a large and flabby organ, nothing is so serviceable as a thorough curetting of the uterine cavity and a packing of the cavity with sterilized gauze. The endometrium in these cases will invariably be found hypertrophied and the glands weeping copiously; menorrhagia and metrorrhagia not infrequently complicate the other symptoms. The curette promptly removes the hypertrophied mucous membrane, and the packing of the cavity stimulates the contractility of the muscular walls of the uterus, absorption of unnecessary muscle fibre and fatty tissue, and a return of the uterus to its normal size and shape. The tonicity of the uterine wall is restored, and the fundus remains in an upright position.

I think it may be stated with positiveness that the forms of retro-displacement above referred to will almost invariably respond to judicious treatment, and we may regard the prognosis in such cases as exceedingly promising. I wish to consider now those forms associated with intrapelvic inflammation about which much has been said and written, but in regard to the *treatment* of which professional opinion has very widely differed.

To men of extreme views these cases range themselves under two classes, those which do and those which do not demand surgical treatment. Between these two extremes the judicious practitioner will always find safe ground on which to stand. The pathology of the pelvis and the clinical history of these cases should be studied with care.

When the retro-displacement is kept up by diseased conditions of the tubes and ovaries, the removal of these organs may be a necessary step in the replacement of the uterus. The uterus itself may be movable in the pelvis, but it will be found impossible to support it in its true axis in the pelvis until the diseased tubes and ovaries are removed, as they act as braces to retard the movements of the uterus and to force it into a strained or dependent position.

The extent of the tubal involvement must determine the line of treatment to a great extent. It may, however, be asserted that the symptoms referred to the false position of the uterus will not disappear until the abdomen is opened and the tubes and ovaries released from their adhesions or removed altogether.

Unless the ovaries and tubes are structurally diseased a breaking

up of adhesions may be all that is necessary, but if they are structurally involved removal is then the most judicious treatment. But when adhesions are broken up, or the tubes and ovaries are removed, the uterus must be drawn up in the proper position and held there by either intravaginal or intra-abdominal support. To leave the organ retro-displaced only adds to the discomfort of the patient. The uterus will become firmly fixed in its false position by an adhesive inflammation if care is not exercised in keeping it in its proper axis in the pelvis. Some of you gentlemen will recall the case on which I operated before you a few weeks ago to release the uterus from its fixed position in the pelvis.

An abdominal section had been performed on this woman before coming into this institution for the removal of diseased appendages. She recovered from this procedure, but was left with constant and violent intrapelvic pain, the result of a pelvic peritonitis which had completely tied up the uterus in a fixed retro-displaced position. I hold, then, that where the abdomen is opened to remove the tubes and ovaries or to break up adhesions with a view to liberating the uterus from its fixed position, it is necessary that the uterus should be held in its true axis to prevent a formation of new adhesions. The decision of the question as to when the abdomen should be opened to overcome adhesions in posterior displacements must be determined largely by the clinical history of the case and the degree of restraint in the individual case. I do not believe this decision should be reached hastily, and until efforts at replacement have been tried by manipulations under an anæsthetic. There can be no doubt of the fact that massage will do much to overcome these restraints when carefully employed. Experience teaches that in dealing with these cases the trained observer will soon learn to decide to which method of treatment the case under consideration will be most likely to respond successfully. Where the fixation is firm and unyielding it is useless to temporize. The sooner the abdomen is opened and the restraining influences removed in this class of cases, the better for the patient. The abdomen should not be opened if the uterus is movable in the pelvis until a fair trial of massage and other mechanical movements through the vagina has been given.

Having decided to open the abdomen with a view of restoring the uterus to its proper position, a number of points arise as to the method to be employed for the permanent fixation of the uterus in its normal axis in the pelvis. Very many procedures have been employed for this purpose, and the operator may take advantage of numerous sug-

gestions without going astray. Before opening the abdomen to break up adhesions the operator should be fully satisfied by careful investigation of the case that other procedures are not adapted to the case under consideration.

I will enumerate the different methods which have been employed.

1. *Brandt's Method*.—This consists in breaking up adhesions by means of manipulations through the abdominal wall and vagina. Where the adhesions are slight and pliable this method will be found serviceable in a number of cases.

2. *Schueltz's Method*.—Schueltz dilates the cervix with an aseptic tent. He then introduces the index and middle fingers into the vagina and the latter up to the fundus, and with this finger he draws the fundus forward, while the other hand grasps the abdomen. The adhesions are separated by force.

The uterus is next held in place by the pessary. I have never seen a case where this method could be practised. Others have employed the sound as a substitute for the finger. There is danger of pushing the sound through the uterine wall if force is used. The method is applicable to very few cases.

3. *Schucking's Method*.—Schucking dilates the cervix and then pulls the uterus well down in the vagina with the vulsella. He then introduces through the cervix up to the fundus a special covered curved needle, while an assistant pushes the bladder over to the left side with a catheter he presses the anterior fornix up, and then pushes the needle through the uterine wall, the utero-vesical pouch, and the vaginal wall behind the right pubic bone. A silkworm-gut or silk ligature is inserted into the notch near the end of the needle, and it is pulled back into the cervical canal; the needle is next pushed through the anterior lip of the vaginal cervix until it comes through at the vaginal junction. The needle is then removed and the ligature tied. A pessary is next introduced to support the uterus. The ligatures are left in from ten days to two weeks. The method has been pronounced simple and easy of execution, but it seems to me to be bungling and dangerous, as there is danger to the peritoneum, bladder, and ureters.

4. *The Alexander Operation for shortening the Round Ligament*.—In retro-displacements without adhesions this operation is one of the best. It is almost free from danger, but to an unpractised operator is rather difficult to perform, as the ligaments are not always easily found as they emerge from the canal of Nuck. The round ligaments undoubtedly hold the uterus in an anterior position, and where they have not been weakened or attenuated by degenerative changes the method of shorten-

ing them will be found valuable in holding the fundus in an anterior position. Wylie, Polk, and Lawson Tait have employed methods of shortening the round ligaments by opening the abdomen and reefing the ligaments.

Their procedures differ in technique, but the principles involved are very similar. Each operator aims to hold the uterus in an anterior position by restoring the normal support of the round ligaments.

INTRA-ABDOMINAL METHOD.

Where adhesions have to be overcome the advisability of opening the abdomen must always be considered. It is certainly the easiest and quickest way of severing the bands which hold the uterus in its abnormal position. The technique of this method is comparatively simple. The abdomen is opened in the middle line by a small incision. The index-finger is then introduced and adhesions are severed with care until the uterus is liberated from its restrained position.

The operator seizes the fundus with care with the vulsella and draws the fundus up in line with the incision. With a stout curved needle threaded with sterilized silk he passes the needle through the muscular and peritoneal layer of the abdomen from one-half to three-quarters of an inch from the incision, and then passes the needle through the anterior wall of the uterus, taking a firm hold on the fundus until it emerges on the opposite side. The uterus is now firmly held by the suture. One or two more sutures are passed in a similar manner one-quarter of an inch apart. After examining the uterus and incision to prevent injury to the intestines, and to clean the wound and abdomen, the sutures are tied and left buried in the incision. The abdominal wound is next closed as after a laparotomy. The patient is subsequently treated as after an abdominal section. In a week or ten days the abdominal wound will be healed, and the uterus will have formed connections with the abdominal peritoneum by inflammatory adhesions. I have never found it necessary to scarify the fundus uteri to secure good adhesion. In all the cases in which I have operated the union has been perfect and the uterus remained firmly attached to the abdomen.

Some operators vary the method of suturing the uterus to the abdominal wall, but the general principles are the same. The purpose sought by the operation is to secure support for the uterus by attaching it to the abdominal wall by an artificial ligamentous union. Hysterorrhaphy is no longer an experiment. It has been established upon a sure footing as a surgical procedure applicable to properly selected cases.

Questions have arisen as to the subsequent behavior of the uterus during pregnancy, and as to the relief obtained by the procedure. My experience is too recent and too limited to be of any value in answering the first question.

If we accept the evidence of Edebols, and other operators who have reported cases of pregnancy following the operation, the question is answered in a most satisfactory manner. Edebols has reported four cases of ventral fixation in which pregnancy subsequently occurred. Case I. died with cardiac disease before she reached her full term, but Cases II., III., and IV. were delivered of full-term children without complications, the uterus retaining its attachments during pregnancy and subsequent to parturition. In answer to the question as to the relief offered by the operation, I can answer it from my own personal experience in a most satisfactory way. Up to the present time I have had no mortality from the operation. But recovery in itself from a procedure should not be considered satisfactory unless the results aimed at by the operation have been secured. Ventral fixation has satisfied this latter requirement in my experience. My cases have been restored to health, and have experienced positive and real benefit from the operation. The uterus has remained well suspended, and the symptoms previously present, due to the abnormal conditions of the tubes and ovaries, have disappeared. Where I have been able to observe these cases for some months subsequent to the operation, these observations have been borne out. Bad cases like bad pennies are sure to turn up. If any of my cases have turned up in the hands of other specialists, they have escaped mine.

There is one procedure which I must now call attention to in connection with the treatment of those forms of posterior displacement for which ventral fixation has been suggested. I refer to the operation of vaginal extirpation of the entire uterus and adnexa. Vaginal hysterectomy for bilateral disease of the uterine appendages has come into sudden prominence by reason of the remarkable statistics recently presented by Jacobs, Pean, and Segond showing the advantages of removing diseased tubes and ovaries with the uterus by the vaginal route over the abdominal section.

These statistics are very brilliant, but this line of work is so recent and so new that I should hesitate to advise its adoption in the treatment of posterior displacement associated with bilateral disease of tubes and ovaries unless there are very positive reasons favoring a vaginal hysterectomy.

I am prepared to admit that in some of these cases of retro-dis-

placement vaginal hysterectomy is the ideal operation. But such cases should be selected with care. We are in grave danger of removing organs impaired in function which might be restored to healthy action. The highest aim of surgery is to restore and not to destroy. Vaginal hysterectomy is radical in its results. It removes all possibility of subsequent functional action. It is, therefore, advisable in those cases in which the function has been impaired by diseased conditions of both tubes and ovaries, but where doubt exists as to the possibility of restoring one or both tubes and ovaries to functional value, that abdominal section be performed. By this route the operator can estimate the true condition of both tubes and ovaries, and is in a position to save one or both, or to remove one or both as deemed best for his patient.

In a few cases of ventral fixation I have found it only necessary to remove the tube and ovary on one side, leaving one tube and ovary for subsequent function. The results in these cases have been satisfactory, though pregnancy has not as yet followed in either case. This character of conservatism should be considered worthy of encouragement in cases promising good results.

Medicine.

ACUTE GENERAL PERITONITIS, TOGETHER WITH REMARKS ON THE ADVISABILITY OF OPERA- TION FOR INFLAMMATORY CONDITIONS ARISING IN CONNECTION WITH THE VERMIFORM APPENDIX.

CLINICAL LECTURE DELIVERED AT GUY'S HOSPITAL.

BY W. HALE WHITE, M.D.,

Physician to Guy's Hospital, London, England.

GENTLEMEN,—Mary H., aged twenty-two, was admitted to the hospital on January 17, 1896, for abdominal pain and distention associated with profound collapse. On inquiring into the history we found that her health was usually good, but that two years ago she had had pains in the abdomen and was very queer for a month. Every now and again since then she has complained of similar pains.

The present illness began a fortnight ago with internal pains. These were very severe and were always referred to the right iliac region. She was very sick for the first three or four days, and since then the nausea has been so marked that she has only been able to take a very little milk. The pain was so bad that she went to bed, but as in three days she was no better she got up and walked to see a doctor, who ordered hot fomentations. She went back to bed, and has remained there almost constantly, only getting out occasionally. No doctor has been attending her. Her bowels have been constipated during the illness, and consequently she has frequently taken purgatives. The bowels were opened last on the 16th instant. The pain has gradually become worse, and has spread over the whole abdomen. On the day of admission she walked up to the hospital, about a third of a mile, from her house. The journey took her two hours.

On Admission.—She is profoundly collapsed. Her hands are cold and clammy. Her face is pale and her eyes are bright. Her pulse is small, soft, and very rapid, about one hundred and twenty to the minute. Her temperature was subnormal when she was first seen, but after she

was put to bed and made a little warmer it was 100.2° F. The tongue was slightly furred and rather dry. The abdomen was uniformly and considerably distended. It was so tender that little could be made out on examining it, but it was resonant all over except for an area of dulness in the right iliac fossa, and here the resistance was, if anything, greater than elsewhere. The breathing was shallow, quick, and entirely thoracic. On examining per vaginam a considerable resistance could be felt in the region of the right broad ligament.

We ordered a grain of opium every two hours, for the first six hours, and after that it was given as often as was necessary to keep her thoroughly under its influence. Hot fomentations were applied to the abdomen, and she was ordered two ounces of milk every hour. At night she was much troubled by a hacking cough, which was unaccompanied by any expectoration.

January 18.—This morning she is cold, sweats considerably, and is still in a collapsed condition. The pulse is still rapid, small, feeble, and running, so half a teaspoonful of brandy was ordered every two hours, and this was, in the afternoon, increased to a teaspoonful and a half. The temperature in the early morning again fell to subnormal, but in the afternoon it rose to 101° F. The abdominal pain and tenderness are much less and she remains quiet, but the distention is unaltered. In all respects she became worse as the day went on, so strychnine was given subcutaneously, and in the afternoon, as continuous vomiting began, feeding by the mouth was stopped, and she was fed per rectum with enemata and nutrient suppositories, and the morphine was given subcutaneously.

January 19.—The patient is still in a masked condition of collapse. This morning her temperature was 96°, and the pulse was so weak that it could hardly be counted. In the afternoon she was very restless and the vomiting was very frequent. The stomach was washed out, and after this the vomiting stopped. It was directed that she should have no more morphine. She sank gradually and died about 8 P.M.

When we first saw this patient, the history of abdominal pain, tenderness, and distention, the vomiting, and the constipation pointed to acute peritonitis. When we examined her the uniformly distended, immobile, and tender abdomen confirmed this view, which well accorded with the state of the pulse, her furred tongue, the reflex cough, and her expression. Just as there are two varieties of severe acute pleurisy or pericarditis,—namely, those in which there is a large amount of lymph and little or no fluid, those in which pus is more marked than lymph,—so you meet with severe acute general peritonitis in which there

is a large amount of thick lymph binding all the intestines and organs together, although but little fluid is secreted, and severe acute general peritonitis in which there is not much lymph, but a large quantity of pus, which always contains numbers of bacteria, most of which are *bacillus coli communis*. These two varieties merge one into the other, but in extreme cases the distinction is well marked. It appeared probable that here we had a large amount of lymph with very little fluid, for not only were there no physical signs of fluid, but acute suppurative peritonitis in a person in previous good health is usually due to the perforation of some viscus, and then the patient is taken suddenly seriously ill with severe pain, and hardly ever lives a fortnight. In passing we may notice that often when suppurative peritonitis terminates a long-standing disease in which the patient is very weak, as, for instance, when it follows perforation at the end of a long attack of typhoid fever or perforation in the course of malignant disease of the bowel, its presence may be quite unsuspected during life. During the last year there have been three or four instances of this in my wards. Having decided that this patient had acute general peritonitis, which was chiefly non-suppurative, we next had to think of the cause of it.

In women the three common causes are disease of the pelvic organs, disease of the vermiform appendix, and a perforated gastric ulcer. We quickly put the last out of count, for there was no evidence of it. The onset of the disease was not sudden enough, and the local signs in the right iliac fossa pointed to one of the other causes. The dulness and increased sense of resistance here, together with the patient's statement that she first felt pain in the right iliac region, pointed to a peritonitis, at first local but soon becoming general, which had taken its origin in the appendix. The thickening felt in the neighborhood of the right broad ligament made us, however, hesitate, for it was difficult to say whether the peritonitis had taken its origin in the structures in the right half of the pelvis (probably the Fallopian tube) and had spread chiefly in the direction of the right iliac fossa, giving the signs which were present there, or whether the trouble, having started in the appendix, had spread downward into the pelvis, so that it revealed itself on examination of the vagina. On the whole, we thought that the history of previous attacks rendered appendicitis the more likely of the two.

I have met with three or four cases in women in which the diagnosis between the two conditions gave rise to great difficulty. For instance, only quite recently I saw a case in which the fact that an attack of appendicitis occurred about the time that the patient miscarried led to a wrong diagnosis, as some thickening could be felt on vaginal examina-

tion. I have also seen a case in which appendicitis led to an abscess in Douglas's pouch which burst into the rectum, and I know of an instance in which, after a severe attack of appendicitis, the vermiform appendix became adherent to the ovary, with the result that at each menstrual period the patient had a severe attack of pain and rise of temperature, exactly resembling the first attack of appendicitis. Dr. Cullingworth (*Lancet*, July 2, 1892) has recorded a case in which sup-puration in the ovary was due to contamination from an inflamed appendix, and Osler refers to the confusion that may exist between the two conditions.

As soon as we had come to the conclusion that this woman had acute peritonitis, the question presented itself, should we operate? We decided not to do so, for the following reasons:

(1) Operations in the early stage of peritonitis, following the perforation of a gastric ulcer, have often proved successful, but, with this exception, the performance of cœliotomy and cleansing the peritoneal cavity for acute peritonitis is one of the most fatal operations in surgery. (2) It would certainly not have been justifiable in the present case, as the patient was cold, collapsed, and almost pulseless from the very beginning. (3) Then, too, you will remember that we thought this patient had chiefly plastic peritonitis, without much pus. Now, this is the only variety of acute general peritonitis that can recover under medical treatment; therefore, slight as was her chance of recovery, it was clearly better without an operation. The acute suppurative form is necessarily fatal if left to itself; therefore, if the diagnosis renders this quite certain, and the patient is in such a condition that you think he may survive a cœliotomy, as this is the only means by which life can be saved, you may try it; but remember two things, you must tell the friends that it is one of the most fatal operations in surgery, and you must be absolutely sure you are dealing with the suppurative and not the plastic form, in which the patient stands a better chance without operation, and the adhesions render it almost impossible to wash out the cavity. I have never seen a hospital patient suffering from acute suppurative peritonitis whose condition was good enough to make it justifiable to resort to operative interference, but on three occasions in private practice, the patient having been well treated from the beginning, the attempt has been made to save life by washing out the peritoneal cavity; all three of the cases died.

If in a case of peritonitis you decide not to operate, you must give plenty of opium. I never saw too much given. The best way is to give a grain of opium in the form of a pill every two hours till the

pupils are slightly contracted, and then diminish the dose so that you keep the patient in this condition till the symptoms begin to subside. Be guided by the pupils rather than the respiration, for the peritonitis alone often makes this difficult. Never mind the constipation, the quieter the bowels are the better; when the patient is well again a simple enema will overcome this. If he is sick you should discontinue the opium and give morphine subcutaneously; in fact, many people prefer this to opium; but it always seems to me that some other of the constituents of opium may be doing good, for aught we know. It is often very useful to combine a quarter of a grain of extract of belladonna with each grain of opium, as it helps to keep in check the disagreeable symptoms of restlessness and vomiting which opium produces in some people. Thin flannels, wrung out in hot water, frequently applied to the abdomen, often relieve the pain in it, which may render it necessary to use a cradle to keep off the weight of the bedclothes. The vomiting may be very troublesome, and you will find that very little reliance can be placed upon the drugs which we commonly recommend for it. If such of them as you choose to try do not speedily give relief, you had better wash the stomach out. In both the two last cases of peritonitis I have had under my care, this has stopped the sickness.

Not much food should be given by the mouth: an ounce of milk every hour or half-hour is quite enough, and if the patient is sick you must use enemata. Before beginning these wash the rectum out with a few ounces of water at 100° F. From four to six rectal applications in the twenty-four hours are enough; the first, third, and fifth should be nutrient enemata. The egg and milk enema of the Guy's pharmacopœia is a good one, or you may take the yolks of six eggs, a drachm and a half of common salt, rather less than the same amount of pepsin, and seven fluidounces of a 0.16-per-cent. solution of hydrochloric acid, keep the mixture in a warm chamber for ten hours, and use four fluidounces for each enema. The second, fourth, and sixth supplies of food should be nutrient suppositories; those with a digestible basis are better than those having a basis of cocoa butter.

So much for the diagnosis and treatment of our case. We found at the post-mortem that she had acute general peritonitis, chiefly plastic, for there were only a few ounces of thin pus discoverable, but everywhere there was much thick lymph, especially in the region of the cæcum, where it formed a great, thick mass covering the cæcum, and making it difficult to find the appendix, so that at first sight we thought this organ had been the cause of the mischief, but it turned out to be quite healthy, and we found that there were several abscesses in the

broad ligaments from which the peritonitis had spread in the first place up to the cæcum, and that later it had become general. The structures in the ligaments were so distorted that it was very difficult to make out their relationship, but there was every probability that the trouble had begun in one of the Fallopian tubes.

This seems a convenient opportunity for the discussion of the question of operation in cases of perityphlitis, or appendicitis, as it is often called. Three conditions may require operation: (a) acute general peritonitis, which we have already discussed (this occurs in less than ten per cent. of all cases); (b) abscess, which also occurs in less than ten per cent.; (c) relapsing cases.

If in any case of appendicitis the temperature remains up after the end of the fourth or fifth day, and the patient has not got general peritonitis, you should always suspect abscess, which is especially met with when there has been a very large amount of dulness and thickening in the cæcal region. The other signs are those which indicate an abscess elsewhere, such as rapid pulse, furred tongue, and irregular temperature, together with local signs, perhaps such as a definite, painful swelling, which becomes tender; but usually from the general signs you may fairly conclude there is pus before the local symptoms have become marked, and you ought, generally, to make it out before redness and œdema of the skin and definite fluctuation have appeared. The commonest seat for the abscess is over the cæcum, but the pus not rarely travels upward and backward in the region of the kidney, and many cases of right-sided perirenal suppuration owe their origin to the vermiform appendix. I was able to show you an instance of this about a year ago. It may even travel up behind the peritoneum and through the diaphragm into the right pleura, where it sets up an empyema. A case illustrating this was in the hospital under my care some time ago. Indeed, the appendix is so variable in its length and direction that it is a good general rule to think of this organ wherever you have to deal with any suppuration within a radius of six inches from the cæcum. I have known an abscess starting in the appendix to present between the liver and stomach; here the tip of the appendix lay close to the pancreas; also, I have seen it present at Poupart's ligament on the left side, and in another case it pointed through the right saphenous opening, and I have already referred to the instance in which it burst into the rectum. If you have made up your mind that there is an abscess, you must, if you can get at it, evacuate the pus and remove the appendix. This may be very difficult to do, and it may require most careful packing to prevent the pus from escaping into the peritoneal

cavity. This happened in the case in which the abscess presented between the liver and stomach, and also in that in which it appeared near Poupart's ligament on the left side. In each case the patient died.

The other condition for which operation may be required is relapsing appendicitis, in which it is often desirable to operate between the attacks to prevent their recurrence.

More than eighty per cent. of all cases develop neither general peritonitis nor abscess, and get over their attack without much difficulty. These cases are for the most part mild, and there is probably some catarrh of the appendix with a little local peritonitis around it, but this may be very slight. I have seen an appendix which was quite thick and rigid from repeated attacks of catarrh removed and there was no appreciable local peritonitis. In a few cases there is an ulcer in the appendix, due to an impacted mass of hard fæces, and in excessively rare cases a foreign body lodges there and forms an ulcer. There is in the museum a grain of wheat which I found in an appendix. Taking all these cases together, at least one in every four—I think the proportion is probably much higher—will have one or more attacks, in each of which the patient may be one of the ten per cent. who get peritonitis which will prove almost certainly fatal, if suppurative, and probably fatal if plastic, or one of the ten per cent. who get an abscess, and nearly half the cases of abscess die. Further, each attack is painful and compels the patient to stop his work for a varying period, which alone is a matter of great importance if he is a wage-earner. On the other hand, you have to remember the fact that each attack gets less and less severe, as a rule, and at each return there is less chance of general peritonitis than in a previous one, for in each attack the local peritonitis shuts the appendix off more completely from the general peritoneal cavity. Then, too, the appendix is so varying in position that the surgeon may fail to find it,—I have seen an instance of this quite recently,—or it may be so bound down by adhesions that it cannot be removed. Lastly, although the operation is now so perfected as to be one of the safest in surgery, yet no cœliotomy is quite free from risk. If your patient is an intelligent person, it will be your duty to put these facts before him and to be guided by his age, his general condition, and his occupation, but you should usually advise operation (1) if each successive attack is becoming more severe than the last, or (2) if each attack prevents the patient from following his occupation, (3) if the previous attack was so severe as to endanger life, and (4) if the interval between the attacks is getting shorter. If you do not operate, you

should give opium in sufficient quantity to relieve the pain and keep the bowels constipated. Leeches or hot fomentations may be applied to the cæcal region, small quantities of milk should be given at frequent intervals, and the patient should be kept in bed on his back until at least ten or fourteen days have elapsed since the temperature became normal and the pain disappeared. .

Lastly, remember that there are few diseases about which more mistakes are made. I have several times known appendicitis to be mistaken for intestinal obstruction; twice I have seen it called typhoid fever. I have known it to be called perinephritic abscess, femoral hernia, muscular rheumatism, chronic constipation, pelvic cellulitis, ague, indigestion, and many other common things.

LATENT ANEURISM OF THE AORTA; THE DIFFERENT FORMS OF ANGINA PECTORIS.

CLINICAL LECTURE DELIVERED AT THE CHARITÉ HOSPITAL, PARIS.

BY PROFESSOR POTAIN, M.D.,

Professor of Clinical Medicine in the Paris Faculty; Physician to the Charité Hospital, and Member of the Academy of Medicine of Paris.

GENTLEMEN,—The patient that I am about to show you has none of the typical symptoms of aneurism of the aorta, but there are enough physical signs present to render such a diagnosis possible. The case, moreover, will serve to illustrate the fact that aneurism of the aorta may exist in a latent form and be unsuspected until the case terminates by a sudden rupture.

The patient is a male, fifty-three years old, and has been ill for a long time. He has had typhoid, and intermittent fever followed by attacks of vertigo and some fainting spells that are difficult to define. About a year ago he commenced having attacks of dyspnoea which could not be attributed to any effort which he made at the time, and which came on without any apparent cause. This dyspnoea was increased by his contracting a severe cold in the head, and it is this latter condition to which we owe his entrance into the hospital. The difficulty in breathing, which was excited by a cold in his head, increased to a condition of orthopnoea. Latterly, however, this condition has improved, and he is now suffering only from a slight degree of dyspnoea.

His chest is apparently normal. Auscultation gives some sub-crepitant râles most marked in the region of the scapula. His voice was at first hoarse, but has lately improved somewhat. The cardiac dulness is decidedly increased, but the apex-beat is not displaced. There is no increase of dulness in the aortic region. The subclavian artery is not out of place, and the heart-sounds are about normal. Thus far we have secured only negative signs. His digestion seems normal and there is nothing in the urine to guide us, and yet the

patient is ill enough to come to the hospital. I am led to make a diagnosis of aneurism of the aorta from the following physical signs : (1) The increased area of dulness of the heart without any valvular lesion ; (2) on account of the normal condition of the urine ; and (3) from the fact that the sphygmometer shows the pressure in the blood-vessels to be normal.

Are the symptoms of aneurism in this case sufficiently well developed for us to make a positive diagnosis? It would seem so when we review the following facts: *First*, clinical experience has shown that cases of aneurism will run their full course without giving any sign of their existence that will lead during life to a certain diagnosis. *Second*, the symptoms of aneurism are very various ; the most reliable being those produced by the pressure of the tumor itself on the surrounding parts. These latter may be regarded as pathognomonic, but they are not always present. If, for example, an aneurism be filled with clotted blood at its periphery, it will give rise on percussion to an area of dulness proportional to its extent. This dulness cannot be determined in the majority of cases of aneurism of the abdominal aorta. Even in thoracic aneurisms the outlining of the area of dulness by percussion requires considerable experience and careful training. The area of dulness is better defined in large aneurisms which pass beyond the vertebral column. In the majority of cases of thoracic aneurism there has been some previous attack of pleurisy with effusion which, with its resulting adhesions, often renders percussion extremely difficult and practically of little value. In the neighborhood of the arch of the aorta percussion is more useful. *Third*, at the same time it should be remembered that tumors of the mediastinum, pleural effusions, and abscesses may obscure the diagnosis. *Fourth*, a murmur, which is sometimes single and rarely a double one, may be heard when the aneurism is very large and sac-like. When this murmur is present it is best heard over the orifice of the sac. Often, however, no such murmur will be heard, because the sac is so filled with blood-clots, either partly or entirely, that little or no blood courses in and out of the orifice ; the character of the edges of the orifice also exerts an influence on the murmur, but, as a matter of fact, this sign is but rarely heard.

While the recognition of a distinct tumor is a valuable diagnostic sign, there are certain positions where great difficulties are encountered in outlining it. The existence of an aneurism of the abdominal aorta may be masked by tympanites, and grave symptoms arise before aneurism is even suspected. In aneurism of the arch of the aorta the tumor

is frequently ovoid in shape, and such a mass may be distinguished from abscess in that region by the absence of any elevation of temperature and the presence of *characteristic pulsations*. The latter is of great value in the diagnosis of aneurism. I have never seen a patient who presented a pulsating tumor in the first and second intercostal spaces who eventually was shown to be suffering from an abscess. Occasionally you will come across in your practice cases of pleurisy with effusion, or empyema, which present a pulsation due to the transmission of the heart's action. One should not plunge a trocar into such effusions recklessly.

While, then, the positive or direct signs of aneurism may fail to be developed in certain cases, we must turn to the indirect evidences of its presence before we can arrive at a satisfactory diagnosis. When the aneurism is of considerable size the pulse at a distance from the enlargement will be very much retarded and slower than the action of the heart. Let us recall the fact, which, perhaps, you have already noticed, that the heart-beat is not exactly synchronous with the arterial pulse in the normal condition. If the arteries were solid tubes there would be no delay in the transmission of the arterial pulse, for the reason that a liquid column acting in a rigid tube would transmit any impulse received at one end to the other at once; but, normally, the arteries are elastic, and this elasticity retards the wave-movement of the blood. In the radial artery, while the amount of time varies, it has been calculated that the blood-current is retarded about 0.16 of a second. Any atheroma or sclerosis of the blood-vessels would modify this period and the delay would not be so great.

The most important symptoms of aneurism are those due to pressure, and they will vary with the locality occupied by the aneurism, and with the nature of the structures on which it presses. When the sac is of large size, and situated on the descending arch of the aorta, it will sometimes project into the lung substance and form a box-like cavity. If this pressure continues the aneurism wall may become glued to the lung and eventually form a part of a bronchial tube or of one of its minute ramifications. In such a case the symptoms would be dyspnoea, pulmonary congestion, and, finally, hæmoptysis,—of which the latter may at any time prove fatal.

An aneurism most frequently presses upon the trachea and bronchial tubes, and gives rise to symptoms of pressure such as interference with the recurrent laryngeal nerve, and as a result laryngeal spasm, hoarse voice, etc. It is a curious fact that the trachea and bronchial tubes resist the action of an aneurism with much less success than

they would the growth of tumors or abscesses. When, therefore, there are symptoms of pressure in the neighborhood of the trachea it is always a logical conclusion that an aneurism is present. Other tumors in this region are more apt to envelop the trachea and are not so liable to cause pressure upon it. An aneurism soon narrows the lumen of either the bronchus or the trachea with which it comes in contact so as to make it difficult for air to pass, and gives rise to those modifications of the vesicular murmur which have been called "the horn-blowing noise." Auscultation will give a blowing vesicular sound of rough character, with low pitch, and some tracheal mucous râles. Whenever *the horn-like noise* is present it is pathognomonic, and a diagnosis can be made without even questioning the patient. If the pulmonary vessels are compressed, as they would be by an aneurism, at the roots of the lungs, congestion of those organs is apt to follow and hæmoptysis result. If the pulmonary arteries alone are compressed, the proper circulation of blood in the lungs will be interfered with in proportion to the amount of pressure exerted. It can be readily understood that such an impoverishment of the lung tissue would naturally prepare the way for tuberculosis, just as narrowing of the orifice of the pulmonary artery does, whether it be of the acquired or congenital form.

When the vena cava is compressed there is a dilatation of the veins of the face and neck, upon which there follows a cerebral oedema which causes among other symptoms great sleepiness. The latter symptom is late in appearing. In aneurism of the descending arch of the aorta the left recurrent laryngeal nerve may be irritated or compressed as it winds around the arch of the aorta on its way from the pneumogastric nerve to the under part of the larynx. Pressure upon the recurrent laryngeal nerve causes at first laryngeal spasm, accompanied by a hoarse voice, and finally results in paralysis of the vocal cords. If this paralysis continues the muscles of the larynx will eventually undergo fatty degeneration. This compression of the recurrent laryngeal nerve takes place more frequently in aneurism than in other tumors. When, therefore, paralysis of the vocal cords is observed aneurism should be at once suspected. If, moreover, with the laryngoscope, paralysis of but one of the vocal cords is found while the other is free to move, the diagnosis of aneurism is very much strengthened. If the sympathetic system is compressed by the tumor, unilateral narrowing of the pupil will occur and an important guide in the diagnosis will be secured. Finally, it is well to remember that the clots of an aneurism may become dislodged and cause cerebral

embolism. When, therefore, no other cause for an attack of hemiplegia can be discovered, it is well to recall this possible one.

You will observe, therefore, that a careful study of the symptoms of the case will frequently assist us in arriving at a logical diagnosis although there are no definite and direct signs seen at first. This is especially true of our present patient. His vertigo, dyspnoea, peculiar vesicular sound, and difficulty in getting air into his chest make us feel certain of aneurism, as bronchitis and emphysema would not produce so pronounced a difficulty in breathing. Moreover, his heart is enlarged without any apparent reason for such an enlargement, as it cannot be attributed to any lesion of the valves, there being no murmur present. Nor is the enlargement due to any pulmonary or circulatory obstruction, for in these cases the apex-beat would be deviated from its usual position. It is not the hypertrophy of Bright's disease, as the urine is normal and there is no hypertension of the arteries. There exists, therefore, (1) hypertrophy of the heart of considerable extent without any apparent cause. Having this condition, therefore, associated with (2) dyspnoea and (3) the *horn-like sound* in this man's chest, we may venture to base our diagnosis of aneurism on these three symptoms.

It is fair to suppose that the aneurism is not very large, because it has as yet had no effect on the pulse; the radial artery beats normally. Moreover, tracings of the apex-beat show that there is practically no difference between the radial pulse and these cardiographic tracings. But this evidence is only negative. If there had been present any delay in the radial pulse, we might have suspected that the aneurism was not a single one, as Professor Fournier has shown that multiple aneurisms are frequently seen in syphilis. The only diseases, however, that this patient has had have been intermittent and typhoid fevers. It is well known that these diseases are among the predisposing causes of aneurism.

THE TREATMENT OF ANEURISM OF THE AORTA.

In the treatment of this case the drug that succeeds best, whether the disease is due to syphilis or not, is iodide of potassium. It has been the most successful drug of any that I have prescribed in these cases, and I have frequently seen the growth of the aneurism apparently controlled by its use. In addition to this the patient should have complete rest and a regular moderate diet. A milk diet is excellent in such cases, but for all such patients the amount of food should be limited or it will excite the circulation. I, myself, prefer the salts of sodium, as they are less irritating than those of potassium, and, I

will give him from seventy-five to ninety-five grains of sodium iodide per day in divided doses. The prognosis in regard to the relief which he may secure must be guarded, but we can at least promise him that the vertigo and asthma will greatly improve. As to the general prognosis in such cases, the great majority improve while they are in the hospital, and it is possible that some of them might be permanently cured. Unfortunately, however, as soon as they feel a little better they insist upon leaving the hospital, and do not return again until all their distressing symptoms have come back with renewed force and in a more intractable form.

THE DIFFERENT FORMS OF ANGINA PECTORIS.

There are at present in the wards six patients who have what is usually called angina pectoris, which, as you know, is a painful affection characterized by spasms of pain starting in the region of the heart and reflected down the left upper extremity. While there are a number of affections which are called by this name, the type to which these patients belong is the true variety which was first described by Rougon. In true angina the principal symptoms are first spasmodic pain in the chest, which radiates to the shoulder and arm, and, perhaps, as far down as the fingers of the *left* hand. These attacks are accompanied with great anxiety and dread of impending death. The paroxysmal attacks are at first of short duration, but they return each time with increasing power, and last longer with each attack, until the patient is actually menaced with imminent death. Heberden first gave the name of angina pectoris to this group of symptoms, and while Professor Jaccoud of our Paris faculty finds it a satisfactory one, I, myself, do not like the term, because it leads one to think that it is a single morbid entity or condition, while in reality under this name a number of very different conditions are associated. A variety of terms have been suggested, such as "benign angina pectoris" and "serious angina," but this is a useless form of nomenclature, as clinically there are frequently cases met with which present the gravest symptoms of the disease and yet yield promptly to treatment. The terms "true" and "false" angina have also been suggested, but they are equally unsatisfactory, as these words cannot well be applied to a disease which is really the symptom of lesions very deeply seated. Such a confusion of terms could be avoided by satisfactorily defining the disease, but this is by no means easy to do. Jelineau, who has written a good work on this subject, gives the following definition: "Angina pectoris is an affection characterized by a lancinating pain of extreme severity which appears suddenly in

the sternal region, radiating to the thoracic walls, and frequently to the left upper extremity. So severe is this pain that the patient stops suddenly in great anguish." Such a definition is not satisfactory, because, in the first place, it is too long, and, secondly, it contains only the classical symptoms, which are not always present; for example, the pain is rarely lancinating and seldom very violent. A great number of cases of angina have been observed where the lesions were most intense and decided, and yet very little suffering was produced by them. The suddenness of the seizure is also not a constant factor, there being many cases in which the pain gradually reaches its maximum. While it is true that it frequently occupies the sternal region, it may originate elsewhere, and radiate sometimes to the lower extremities, the neck, or the jaw. The great severity of the pain is not always a constant symptom, and its intensity is often not in proportion to the gravity of the symptoms. A patient once consulted me for pains which started in the neighborhood of the heart and only troubled him occasionally. While I was examining him his pulse suddenly became imperceptible and he died before my eyes. I remember another patient whom I saw in the consulting-room of our hospital, and who had so little trouble from his angina that he at first refused to enter the wards. However, after considerable persuasion, he consented to do as we suggested, and as he was walking up the stairs he fell dead. At the autopsy the characteristic lesions of angina were found. While, however, this definition we have been discussing is not a satisfactory one, it embodies a number of signs which form the symptoms complex of the disease. Whenever you find a patient who complains of pain in the chest, intense in its character, radiating on the anterior wall, and with a tendency to pass to the upper extremities or head, you may strongly suspect the presence of angina pectoris, especially if no gross lesion is present.

The post-mortem evidences of this disease are not always demonstrable. Sometimes you will find the characteristic lesions readily, and again, where you have every reason to expect them, you will find no lesions of the heart whatsoever. The lesions when present are frequently seated in the aorta. Most frequently, however, the coronary arteries are the only ones affected. In this connection it is well to remember that it is not so much the atheroma of the vessel which gives rise to the painful attacks as it is the narrowing of the blood-vessel calibre. The question may well be asked, Is this calcification and atheromatous condition of the blood-vessel the cause of the angina? No, it is not; for you will frequently find at the post-mortem examination of old people, who have never presented during life any symp-

toms of angina, the characteristic lesions of this disease, without, however, any narrowing of the calibre of the arteries. This latter fact is the important thing to bear in mind, as I showed in 1886. There may be atheroma, therefore, of the coronary arteries without angina if the calibre of the arteries is not interfered with. Again, angina may result from a blocking off of the coronary arteries as a result of disease of the aorta at its orifice. While ischæmia or a deficiency of blood to the part is a cause of angina, and its presence is a constant one, yet the effects of ischæmia are intermittent. How can this be explained? It is probable that these attacks may be explained by the functional activity of the heart being modified by the incompleteness of the blood-supply. When we recall that the function of the circulation in a muscle such as the heart is a double one,—i.e., first, it brings to the heart-muscle necessary nutrition; and, second, it carries away the carbonic acid and the lactic acid products of decomposition after having given up its oxygen,—it follows that so long as this nutrition can be accomplished in a normal manner a small amount of blood is sufficient, but for the rapid and satisfactory working of the muscular structure of the heart a large supply is required. The proper nutrition of the heart may go on when the heart's action has been greatly reduced, and has practically almost ceased. There are in such cases, however, under certain conditions, moments of excitement when the nutrition cannot be properly performed, and degeneration follows. The narrowing of the orifice of one or both of the coronary arteries is sufficient to make the circulation incomplete, and thus cause a limitation of the functional power of the heart.

In the normal condition the heart receives enough blood for a moderate amount of work at each systolic contraction, but if in the case of one of these patients such as we had before us some sudden and considerable muscular effort is made, the intracardiac circulation is no longer sufficient to supply the demands made upon it, and the heart shows the difficulty under which it is laboring by an attack of angina. It is well to recall in this connection a peculiar affection which is seen in horses and is more or less intermittent in character. In this animal one of the iliac arteries may become narrowed and the circulation interfered with the moment he is pushed to a gallop or worked hard. If the animal is allowed to walk or trot slowly he can be of great service to his owner. When, however, he is pushed to a gallop the action of the muscles makes such demands on the heart that the muscles of the back part of the leg no longer receive enough blood for the work they have to do, and the horse falls to the ground with his limbs

cold, sweating, and rigid. The attack may pass away quickly, but will return if he is pushed again beyond a trot.

The narrowing of the openings into the coronary arteries may be so considerable that one may be unable to pass a fine thread through them. Both of the arteries may be attacked, and, indeed, in nine cases of sudden death which we have examined they were found so. The clinical aspects of the case are usually similar. The pain has its seat in the anterior part of the chest, and the patients complain of a sensation of gnawing or tearing, or else they complain of a feeling of constriction. The paroxysms of intense pain are frequent, and resemble attacks of visceral colic. Many writers speak of a sensation of impending death that these patients have, and that such a symptom is very difficult to define. In a great number of cases there is no dyspnoea, the respirations, on the contrary, being slow and without any force. When there is dyspnoea it is usually due to some complication, such as pulmonary congestion. When the pulse is weak and feeble it is always a sign of great danger, and the condition of the pulse should be carefully watched. Frequently, at the end of the attack, the patient will have gaseous eructations. I need not dwell longer, however, on the diagnosis of these cases. What I wish especially to impress upon you is the fact that when angina pectoris becomes associated with the symptoms of a case where there is a well-marked aortic lesion, you should always suspect a narrowing of the coronary arteries. That form of angina pectoris, which is caused by a lesion of the coronary arteries at their orifices, can be cured, because the alteration or disease of the aorta which has brought about the narrowing of the coronary arteries can be made to disappear.

THE TREATMENT OF ANGINA PECTORIS.

The treatment of these cases consists in the use of either potassium or sodium iodide in doses of from five to twenty grains per day in divided doses. This medication should be continued for a year or eighteen months. A solution of a strength of two per cent. is an excellent one to use, and should be given for three weeks in the month, allowing one week without any medicine in each month. The diet of such patients should be carefully regulated so as to avoid any unnecessary or excessive feeding, and the amount of muscular effort which they are allowed to take should not be out of proportion to the heart's strength. Everything should be done to maintain the proper equilibrium of the circulation, and all excessive effort which would tend to aggravate the heart's action should be carefully avoided.

HEMORRHAGIC PANCREATITIS.

CLINICAL LECTURE DELIVERED IN THE EDINBURGH ROYAL INFIRMARY.

BY ALEXANDER JAMES, M.D., F.R.C.P.E.,

Physician to the Edinburgh Royal Infirmary ; and Lecturer on the Practice of
Medicine in the Edinburgh Medical School.

GENTLEMEN,—Shortly after five o'clock on the evening of January 14, 1896, I received a hurriedly-written note from my infirmary resident, informing me that a case had just arrived from the country presenting many of the symptoms of acute perforative peritonitis and stating that he desired my opinion as to whether operative interference might or might not be appropriate. I came up to the infirmary, but found on my arrival that the patient had just died. My resident's notes on the case were, however, as follows :

Robert B., aged fifty-four, sergeant of police, a powerfully built and well-nourished man, was admitted to Ward 30, shortly after five o'clock on the afternoon of Tuesday, January 14. He was brought to the infirmary in an ambulance-wagon, and when admitted was in a state of shock. He was conscious but made no complaint. He could not, however, answer intelligently the questions put to him. His face was pale, and bore an expression of great anxiety. His pupils were widely dilated, and his pulse at the wrist was scarcely perceptible and was obliterated by the very slightest pressure. His breathing was easy, but rather shallow, and a little hurried, and it was noticed that the rhythm was frequently disturbed, presenting now and again a somewhat Cheyne-Stokes character. The hands, feet, and nose were very cold.

Auscultation of the heart discovered no lesion, but the first sound was almost inaudible. The abdomen showed no distention. On palpation it was thought that there was, perhaps, a slightly increased sense of resistance in the left iliac region, and there seemed to be a little tenderness on pressure there. Elsewhere the abdominal parietes were quite flaccid, and fairly firm pressure discovered no tenderness.

The patient was surrounded with hot bottles, and ether, strophan-

thine, and strychnine were freely administered hypodermically, but with no effect on the pulse.

At about a quarter to six, the patient became very restless, shifting his position in bed, and trying to sit up. The pulse at the wrist could not be felt. At six o'clock, about an hour after his admission, he died.

The doctor who had sent him to the infirmary informed me that he had never previously attended him professionally. He said that he had always appeared to be in robust health, but that there was no doubt that he had been somewhat intemperate as regards alcohol, especially during the last six or eight months. From his letter about the patient I quote the following: "His wife states that he made no complaint of any kind previously, but his fellow-policeman mentioned that he had occasionally complained of pain in the small of the back during the past year; that during the last few days he had sometimes complained of his stomach, and especially that on the evening of Thursday, January 9, he was suddenly attacked with abdominal pain. The patient himself described the pain as being between his heart and his stomach. This pain lasted all night, and then passed off. On Monday, January 13, at 10 A.M., he was seated in his house, writing, when he was suddenly seized with severe pain in the epigastrium. He said that he felt as if his stomach had been stabbed with a knife. He walked upstairs and went to bed, the pain continuing all day. He vomited repeatedly. At this time the abdominal muscles seem to have been spasmodically contracted, as his wife stated that 'balls' formed. Attacks of hiccough came on frequently, the pains being much aggravated while they lasted.

"I saw him first after 5 P.M. He was then suffering from a slight degree of shock and complaining of intense paroxysmal pain in the epigastric region. I gave one-half a grain of morphine hypodermically, and as this had no effect, I injected another one-third of a grain. The pain was less during the night, but he did not sleep, and in the morning, the pain returned with great severity and he was much more collapsed. I diagnosed a small perforation, and sent him to the infirmary with the faint hope that abdominal section might be of service."

This was a case, then, where a man, apparently in the midst of perfect health, was seized with sudden severe epigastric pain, vomiting, and hiccough, associated with a collapse which killed him within thirty-two hours. Those symptoms were certainly like the symptoms of a perforative peritonitis, but it was remarked that the abdominal distention and tenderness were not so manifest as might have been expected, at any rate on his admission.

The post-mortem examination was performed on January 15, and the following is a summary of the report of Dr. Muir, pathologist to the infirmary.

External Appearances.—The body was well nourished and muscular, and there was some obesity of the abdominal wall. Rigidity was strongly marked. Slight lividity of the head and neck, and deep lividity posteriorly. There was some fluid blood oozing from the nostrils.

Abdomen.—Peritoneum. The surface of the whole intestine was deeply congested, and had at most places a slightly granular appearance, with very slight traces of soft fibrin here and there. There was a small quantity of turbid fluid at places between the coils of intestine, and about one ounce of dirty, slightly brownish fluid, which had a somewhat fecal odor, in the pouch of Douglas. The condition was a very recent acute peritonitis, with very little fibrinous exudation. There was no lymph over the spleen or liver. The coils of small intestine were somewhat distended. There was a good deal of matting of the great omentum, which was drawn up and thickened and adherent along the right side to the ascending colon. The transverse colon was adherent to the under surface of the liver and gall-bladder, and there was general thickening of the peritoneum below the stomach. There were also general thickening and adhesions in front of the pancreas, and adhesions were present over the spleen and in its vicinity.

Stomach.—This contained a few ounces of fluid contents of a whitish color, the organ was a little dilated, but its mucous membrane was perfectly healthy.

Duodenum.—This contained a large quantity of yellowish fluid material. Its mucous membrane appeared healthy, except that it was a little swollen and soft. No ulcers could be found. At the lower part of its descending portion there were two pouches or diverticula in its wall. The larger of the two was the higher, and its size was such that it could contain a small marble, the opening into it admitting the point of the forefinger. This pouch was on the inner wall, and rather posterior, coming thus into relation with the under border of the head of the pancreas. It was lined with a smooth mucous membrane which showed no traces of ulceration, but the wall was exceedingly thin, especially in the deep part. About half an inch below this pouch, and on the same side, there was another, somewhat smaller in size, but with similar characters.

Small Intestine.—There was another small pouch in the jejunum, about four feet from the lower end of the duodenum, which projected

into the attached mesentery. This pouch had the same character as the others, but was smaller, being large enough to contain a pea. Beyond a general pulpiness of the mucous membrane, the small intestine was healthy.

Large Intestine.—The ascending and transverse colon were somewhat dilated and contained some semifluid faecal masses. The descending colon was constricted and empty. There were two small pouches in the descending colon, of similar character to those described above. No ulcerations or perforations were found in any part of the alimentary tract, and all these pouches appeared to be of congenital nature, and not the result of any disease.

Pancreas.—The head of the pancreas was enlarged, and, with the chronic thickening of the tissues around it, formed a large firm mass. There was also an excess of fat around. Distinct extravasations of blood were present in the tissues around the pancreas, and especially below it, the region having a dark purple-red color. These extravasations were evidently recent. On cutting into the pancreas, extensive changes were found in the head. These affected chiefly the half of the head next to the duodenum, though there were some scattered patches more to the left side. In the region mentioned, the pancreas was studded with regular areas of pale white and yellow color of irregular shape, and of various sizes, whilst around there were numerous hemorrhages of a diffuse nature, in color from a deep purple to a pinkish red. These hemorrhages appeared to be comparatively recent, and the tissue had, therefore, a markedly patchy appearance. The pale and yellow patches were evidently due to necrosis of the tissue, and some of them, especially the yellow colored ones, were well marked off, and apparently of longest standing. The tissue was generally firm, but at places there were slight signs of softening, and at the lower border of the head and outside of the organ there was a small space which contained a pinkish opaque fluid, apparently pus mixed with blood. The margin of the pancreas in relation to this was somewhat softened. This space was close to the floor of the larger duodenal pouch, and it appeared probable that a bacterial infection had taken place by this path, affecting first the cellular tissue, and afterwards extending to the pancreas.

The pancreatic duct was a little dilated but showed nothing abnormal. One of its small branches, however, in relation to the necrosed area, contained some purulent fluid. The tail of the pancreas showed only slight induration. Microscopic examination of the contents of the softened part showed pus-corpuses and large numbers

of bacilli, resembling the bacillus coli, though many were rather larger in size.

Liver.—This was rather pale, and showed some fatty infiltration. It did not give a distinct iron reaction with hydrochloric acid and potassium ferrocyanide. The gall-bladder was dilated, and contained some grumous yellow bile. The biliary passages were normal. The suprarenals showed nothing abnormal.

Spleen.—Weight six ounces. The capsule showed general thickening and the pulp showed general atrophy, and was of a dark red color.

Kidneys.—The left weighed seven ounces, right weighed five ounces. They showed some recent venous congestion, but otherwise they were normal.

Heart.—The right side was distended with dark blood, which was quite fluid, as was the blood everywhere. The heart substance and valves were normal, but there was rather an excess of fat on its surface.

Lungs.—There was extensive diffuse hemorrhage into the posterior parts of both lungs, areas of lung tissue being practically airless from this cause. The rest of the tissue was congested, as was also the bronchial mucous membrane.

Brain.—This showed nothing abnormal beyond slight general atrophy, with opalescence of the arachnoid, and slight enlargement of the ventricles. It was on the whole anæmic.

The essential results, therefore, of the post-mortem examination were—evidence of inflammatory changes, with extensive hemorrhage into the tissues of the pancreas and at one part also evidence of supuration and necrosis, with slight general peritonitis, and hemorrhage into the lungs.

Let us now consider for a little what is known of such lesions. Although acquaintance with them is not so general as it ought to be, they are yet well recognized, and perhaps the best accounts of them which are to be got are those of an American physician, Dr. Fitz, published in the *New York Medical Record* for 1889. Fitz's contributions contain many carefully-selected and observed instances of this kind of pancreatic disease, and, based on them, he has subdivided the lesions into four anatomical varieties,—viz., 1, pancreatic hemorrhage; 2, hemorrhagic pancreatitis; 3, suppurative pancreatitis; and, 4, gangrenous pancreatitis. The case of our patient B. would fall into the variety of hemorrhagic pancreatitis.

But now if we study those conditions and Fitz's description of them in detail, we can, I think, elicit some interesting points.

We find that though, almost without exception, they terminate

fatally, their duration is different, and their symptoms correspondingly vary. As regards duration, for example, pancreatic hemorrhage is fatal in periods varying from a few minutes or even seconds to thirty-six hours; hemorrhagic pancreatitis in from eight hours to three days; gangrenous pancreatitis in from four days to eight weeks; and suppurative pancreatitis in from eleven days to nine months.

Next, as regards symptoms. Pancreatic hemorrhage, in its acute form, manifests itself simply as severe epigastric pain, and more or less sudden death; hemorrhagic pancreatitis begins by severe epigastric pain, but the collapse is slower in occurring, and the patient has for symptoms vomiting, nausea, hiccough, and general peritonitic symptoms during the few hours which he lives. Again, in the gangrenous and suppurative forms, though the symptoms usually begin in the same way, the disease is more prolonged, and in addition to the nausea, vomiting, epigastric pain, and tenderness, in time diarrhoea, chills, and sweatings, loss of flesh, etc., show themselves. Further, we find that whilst the post-mortem records show that pancreatic hemorrhage and suppurative pancreatitis seem for the most part to occur alone, yet, in certain of the cases of gangrenous pancreatitis, there is found evidence of hemorrhage and pus, and in hemorrhagic pancreatitis there may be found pus-formation and necrosis.

A first conclusion, which I think is forced upon us by those considerations, is that hemorrhagic, gangrenous, and suppurative pancreatitis are simply different stages of the same malady. Let us suppose a pancreatitis with rapidly occurring and extensive hemorrhage, the patient will then die before any other pathological changes can occur, the cause of death being probably in part the loss of blood into the pancreas and surrounding tissues, and in part the shock from implication of the branches of the important solar plexus which are in the proximity of the pancreas. Let us suppose, on the other hand, a case in which the inflammatory and hemorrhagic processes have been less extensive than before the fatal issue, a sufficient time will have elapsed to permit of necrotic or gangrenous changes. Finally, we can suppose that where the inflammatory process is still more chronic, and where the hemorrhages are still less marked, the malady may hang on for months, and, with diffuse or circumscribed pus formation, we shall have a case which may fall under the category of suppurative pancreatitis.

But next, can we distinguish between pancreatic hemorrhage and hemorrhagic pancreatitis. Many authors hold that the distinction between them is founded on insufficient data. In our patient B. we

have, I think, evidence both clinical and pathological that an inflammatory process had preceded the hemorrhage. As you will remember, there were found at the autopsy matting of the great omentum and great thickening of the tissues in the neighborhood of the pancreas, with a history of his having complained of pains in the small of the back during the past year.

But we must, at any rate, allow the possibility of hemorrhage being the first item in the pathological process. We know that experimentally it has been demonstrated that hemorrhages into the lung, stomach, etc., may occur as the result of certain nerve irritations, and we can imagine the possibility of a similar process occurring in the pancreas. Further, we can understand that, as the result of injury, hemorrhage into the pancreas may occur. In this connection I saw, some four years ago, a case of suppurative pancreatitis. This occurred in a man of thirty, who died after an illness of over two months, having for symptoms epigastric pain and tenderness, vomiting, occasional diarrhoea, and loss of flesh. On the first occasion on which I saw him, I distinctly felt an ill-defined tumor in the epigastrium, and I believe the case to be one of malignant disease, in spite of his age and history of previous good health. Curiously, however (so I thought at the time), the tumor disappeared after a few weeks, and on post-mortem examination I found suppuration in the pancreas and around it.

Some time after his death, I was informed by his brother, that the patient had received a very severe blow in the epigastrium, and that this had really been the beginning of his illness. This was a case of suppurative pancreatitis, due, I believe, to trauma, but whether there had been a hemorrhage at the beginning or not, one cannot say. It is clear, however, that, on the one hand, a hemorrhage into the pancreas will lead to pancreatitis, and, on the other, that a pancreatitis will be very apt to have following it a hemorrhage. In our patient we found the blood in the heart to be remarkably fluid, and in addition to hemorrhages into the pancreas and tissues around, there was, you will remember, a huge hemorrhage into the lungs. Moreover, in other cases of this disease hemorrhages into the fat and connective tissues generally, as in pernicious anæmia, have been met with, and it was in this connection that we examined the liver in our present case for traces of iron.

But now, supposing that the inflammation of the pancreas is the primary process, how may it be set up? According to Fitz and other authors it may result from,—

1. Extension of gastro-duodenal inflammation along the pancreatic

duct. One case is described as having followed the ingestion of a putrid sausage.

2. Irritation from the presence of a worm in the pancreatic duct.

3. Perforating inflammation of the gastro-duodenal or biliary tracts.

In our patient there was no perforation, but, as you will remember, there were pouches on the duodenum, probably congenital. Through the thinned wall of these, we believe, infection occurred, setting up chronic inflammation of the head of the pancreas and surrounding parts. Aggravated probably by errors of diet, and possibly alcohol, these inflammatory changes became in time more and more marked. Then, on January 9 there was, I think, a slight hemorrhage, causing the sudden acute pain which he complained of on that day. This was followed on January 13 by the severe hemorrhage which caused his death.

The course of these varieties of pancreatic disease is almost invariably, as stated, towards a fatal issue. One case, however, of gangrenous pancreatitis is reported as having recovered, the necrosed organ sloughing into the bowel, and being passed per anum.

As regards treatment, nothing need be said except that it must be symptomatic.

Finally, gentlemen, it may be thought that some apology is required for my having lectured to you in a clinical theatre upon a subject in which treatment is of so little consequence, and in connection with which pathology appears to be all-important. I would offer in excuse the fact that the knowledge and recognition of disease is the first requisite in every case. This disease is not so well known as it ought to be, and is extremely difficult of recognition. It has often been confounded with perforation and has led to laparotomy, fortunately, however, with no real evil result. Causing at times sudden death, in the midst of apparently perfect health, it has also, as you can understand, occasionally formed the subject of medico-legal inquiry. I feel, therefore, that it is of sufficient importance to have been brought before your notice to-day.

HYDRO-PNEUMOTHORAX.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY CHARLES G. STOCKTON, M.D.,

Professor of Medicine in the Medical Department of the University of Buffalo, New York, and Physician to the Buffalo General Hospital.

GENTLEMEN,—This case of hydro-pneumothorax, which you have seen in the ward, I shall aspirate in order to determine the nature of the liquid present. The history of the case is as follows: A German laborer, aged thirty-eight, entered the hospital four months ago; he came from Germany when twenty-one years old. Family history good; habits good; married, and has had three children. He has had fair health until a year ago, when he began to cough, principally at night and in the morning; he complains of pain over the right lung. On taking a deep inspiration there are paroxysmal cough and great pain in the region of the right nipple, with copious, frothy, sero-purulent expectoration. Temperature, 100.5° F.; pulse, 105; respiration, 36. The urine is very acid; specific gravity, 1018, yellow, no albumen nor sugar.

November 9, 1890, dulness on right side anteriorly when lying on his face, but changing to tympanitic resonance when lying on the back. Over the most dependent portion of the chest there is dulness merging into flatness, and there is absence of the pulmonary respiratory murmur. On December 6 he was discharged improved.

As I have told you in the ward-class, the physical signs in this case have been most contradictory. On the whole, there was evidence of hydro-pneumothorax, and that became clearer as time went on. So far as the physical signs are concerned, the case is not now unlike the ordinary case of this disease, but there is less bulging of the side, less dyspnoea, and, although it has continued for a number of months, the man appears before you in a fairly comfortable condition.

When auscultation of the voice is attempted the patient becomes excited and has a nervous, hysterical cough. He becomes excited if

he attempts to walk, and he presents evidences of cord-disease, with involvement of the posterior and lateral tracts. There is no atrophy of the muscles; there is a spastic gait and the reflexes are exaggerated.

The sputum was examined when he first entered the hospital, and at that time tubercle bacilli were found. The patient re-entered the hospital on December 29, suffering from dyspnoea. He had been walking, and the exertion had put him in great pain. His right lung was filled with moist, crackling râles; there was diminished respiratory sound where there had been a puerile respiratory murmur, and the left lung showed evidences of infiltration which had been previously demonstrated. The dyspnoea was so great, and there was so much hyperæmia of the left lung, that dry cups were applied, and the patient given a hot mustard foot-bath and stimulants. These measures afforded relief.

Upon inspection you see that he moves the upper part of each side of the thorax in inspiration; the lower part of the right chest is immovable. On the left side the costal type of respiration is present. On palpation there is vocal fremitus at the upper portion of the chest on both sides, and at the lower portion of the chest on the left side; it is absent at the lower portion of the chest on the right side.

On percussion there is lessened resonance at the apex of the right lung, particularly below the clavicle. At the third rib and below there is almost flatness on the right side. In the fifth space there is absolute flatness. We must have either a solid lung to deal with or fluid filling the lower portion of the chest.

By auscultation we get a little tubular breathing in the upper part of the right chest, and broncho-vesicular breathing as well. Below there is only a very distant breathing sound that is amphoric, and that over a place where we would hardly expect breathing-sounds, on account of the flatness on percussion. On the left side there is good breathing, but moist râles, which are a residue of the acute congestion of the lungs which existed a short time ago.

Posteriorly, in the suprascapular regions, there is fair resonance on both sides. In the interscapular region of the right side there is dullness; on the left side resonance. Posteriorly near the axillary line, just under the scapula, there is resonance of a peculiar quality. It is an amphoric, almost a crack-pot sound. Passing downward and forward, following a line from the lower border of the scapula to the ensiform cartilage, in a strip two or three inches wide, we get amphoric resonance, and in some places the "crack-pot" sound. There is absence of fremitus below the scapula. With the patient lying on the table

there is a change in the sound. Where there was dulness in the mammary region there is now marked resonance, which extends downward over the region of the liver, showing that the pleural cavity is distended with liquid and air, so that the liver is displaced downward. The resonance is amphoric. On the left side there is ordinary resonance.

At the apex of the right lung there is now dulness, and posteriorly there is complete flatness, which, in my opinion, is accounted for by the gravitation of the fluid to the back when the patient lies in this position. I believe that this man has a lung tied down by pleuritic adhesions, that it is thus held down posteriorly, and that, by reason of these adhesions, he is enabled to expand his right lung to some extent, because the pleural cavity is limited, and, therefore, compression occurs over a smaller surface, and, therefore, dyspnoea is less marked.

Using this small aspirating-needle, I puncture the chest anteriorly in the fifth intercostal space. The needle enters a cavity. The free end of the tube connected with the needle is placed under an antiseptic solution so that no air can enter the pleural cavity from without. At first you notice only a small amount of fluid comes out, but now, as the patient breathes and coughs, a considerable volume of air escapes. There is no special reason for emptying the thorax of air so long as the opening into the lung exists, for the pleural cavity will fill again. There is a bare possibility, however, that the opening is closed, and in that case it would be a good plan to draw off this air and fluid. Therefore I will aspirate the chest, using Potain's instrument. After inserting the canula and trocar, I withdraw the latter, so that the smooth, round point of the canula alone remains in the chest, and this will do no harm, even if it comes in contact with the lung. About an ounce and a half of yellowish fluid and some air are withdrawn while the patient lies on his back. On placing him in the sitting posture no more fluid escapes. Percussion now reveals dulness in front where there was tympany. Posteriorly there are still amphoric resonance and the "crack-pot" sound which was entirely absent with the patient lying on his back.

We have demonstrated the presence of air and liquid, and have upheld the diagnosis of pneumo-hydrothorax. We have accounted for the changing sounds by the change in position. We have still to account for the fact that, after withdrawing a small amount of air and fluid, a dry cavity is left. This, it seems to me, proves that there are adhesions dividing the thoracic cavity into compartments, and this very condition, by holding the lung downward to the chest wall, permits the patient to breathe, and has undoubtedly prolonged his life.

February 18, 1891.—Following the withdrawal of the fluid and air at a previous clinic there was great relief, and the temperature, which had been on the average 103° F., fell to normal almost immediately, and it has been quite low ever since. The breathing also was improved. I do not know quite why these changes took place. In my subsequent efforts to draw off the fluid from around the lung I have been hampered by the fact that the pleural cavity is divided by adhesions into a large number of small compartments. I have seen cases in which I have failed to remove much fluid after frequent aspirations, and in post-mortem examination the fact has been explained by the almost innumerable little spaces formed in the pleural cavity by bands of adhesions, making a mass of cells throughout. It is possible that there is some large compartment here, and it is with this hope that I am about to aspirate again this morning.

The aspirator-needle is introduced below the angle of the scapula in the eighth intercostal space. The liver is forced down by the fluid so that there is no danger of striking it. As the fluid runs through the tube it appears somewhat milky, and it is quite probable that it is purulent. The patient has not had the classical septic fever; his temperature has reached from 98.5° to 101° F.,—more characteristic of the ordinary phthisical process than of an accumulation of pus. I have evidently found a larger cavity this time than previously. It may be that the small cavities have been pressed aside by the larger accumulation in this one.

Meanwhile, air has been drawn off from the man's chest by aspirating in the seventh intercostal space in the axillary line. An attempt has also been made to withdraw fluid through punctures, one quite well towards the nipple line, and one midway between the angle of the scapula and the axillary line. On account of the coughing I will remove the aspirator-needle. Coughing is often induced by the expansion of the lung incident to tapping; the unaccustomed expansion causes a reflex cough, and the cough stretches the lung violently. The too sudden removal of a large quantity of fluid which has been in the pleural cavity for some time may set up a pulmonary œdema, because of the removal of the support of the pulmonary blood-vessels. If, on the other hand, the effusion is a recent one, you may withdraw almost the entire quantity of fluid at one sitting without danger, because the tissues of the lung have not lost their elasticity.

If this fluid is found to contain a large number of pus cells, and especially if the collection becomes still more purulent, it may be well to make a free incision to procure drainage on this side.

THE SPONTANEOUS RELIEF OF ASCITES.

CLINICAL LECTURE DELIVERED AT THE LONDON HOSPITAL.

BY CHARLES HENRY RALFE, M.A., M.D. (Cantab.), F.R.C.P. (Lond.),
Physician to the London Hospital, etc.

GENTLEMEN,—Physicians have long regarded those diseases of the liver which result in blockage of the portal circulation as the most serious of all affections of that organ, especially when associated with extensive and persistent effusion into the peritoneum. This was certainly the view I took of the three cases I now briefly narrate, because I do not remember ever seeing more hopeless examples of hepatic dropsy than the first two cases. In the first a third tapping was alone postponed because an experienced London surgeon considered the patient too weak to bear even a gradual removal of the fluid, and in this opinion the attendant physicians concurred. In the second case not only was the peritoneum distended with fluid, and the cutaneous covering of the abdomen thick with black tortuous veins of the collateral circulation, but there were a large ventral hernia and a biliary fistula, whilst, owing to some obstruction of the inferior vena cava, the whole of the lower extremities up to the chest were anasarcaous. The third case was not so severe, though there were many circumstances connected with it that seemed to make ultimate recovery impossible. As the complete relief which followed in all three instances could in no way be attributed to medical treatment, I need have no hesitation in bringing them forward, whilst a relation of the details may afford valuable insight into the causes that brought about relief in each case. In the first, in the early part of my attendance on the case, I thought, and still think, that the original cause of the ascites was a failure of the heart's action associated with a liver already undergoing hypertrophic cirrhosis. It will occur to many that that subject formed one of the numerous original points touched upon by Professor Drummond in his admirable address at Newcastle-on-Tyne, at the British Medical Association meet-

ing in August, 1893.¹ Certainly so long as the heart's action was supported we kept the ascites at bay, though we could not reduce it. What ultimately removed the fluid was evidently an attack of pyrexia (broncho-pneumonia), during which time, a period of three weeks, the temperatures ranged from 102° to 104° F. We know the extraordinary consumption of water that goes on in the body during the course of a fever, as is shown in the diminution of the aqueous superflux in both diabetes mellitus and insipidus, and certainly shortly after the commencement of the pyrexia the belly became daily more flaccid, and by the time it was at an end no fluid remained in the peritoneum. The second case manifestly got well from the absorption of a large thrombus in a main channel of the portal vein. The only remedial measures used here were (1) rest in the recumbent position, (2) sea-side air, and (3) the best possible hygiene. The third case was probably due to the same cause as the second, and recovered eventually for the same reason.

CASE I.—M. C., aged thirty-nine years. A very old friend of mine, when she returned from India, about 1880, requested me to look after her as her physician, but, as it has often been found in such cases that friendship and authority cannot go well together, I suggested the name of another physician, who attended her for a long time, though she was much in the habit of changing her medical advisers. About the middle of 1887 I heard that she was dangerously ill, that she had been tapped for ascites, and all through the summer I heard of her increasing illness, and that she had been again tapped; again at the end of July I heard that a third tapping had been proposed, but had been abandoned on account of her weak state, and it was evident that all in attendance believed that the end was near. As there was some difficulty about arranging for her systematic medical attendance during the vacation I agreed to look after her, as in those days I had to take my holiday in October. When I saw her I did not wonder at the opinion that had been formed, and I expected to hear of her death almost hourly. She was propped up with pillows, breathing with extreme difficulty, troubled with constant cough, and the beatings of the tumultuous heart were plainly visible through her clothing. The pulse numbered about 120, but was so feeble that it could scarcely be counted. The etiolated limbs could not be raised without help, the hugely distended abdomen had pushed the liver up above the nipple line, and

¹ Causal Relations in Disease, David Drummond, British Medical Journal, vol. ii., 1893, pp. 297-301.

had pushed the heart also out of position. The action of this again was so tumultuous that the sounds could not be clearly distinguished. The only favorable point about the case was that the kidneys were sound and doing their work well. It was on account of this fact that I determined to act. I thought if we could regain for her a little strength, she might be tapped again. I also fortunately remembered that Dr. Balfour, of Edinburgh, some twelve years before, had discovered a presystolic murmur, and also that when she was a young girl at Bath a physician there had said something of the same sort. I therefore did not hesitate to push the stimulant, which under the previous view, that her distress was due to the condition of her liver, had been very sparingly given. I also stimulated the kidneys with a mixture of spirits of nitre, tincture of squill, juniper, digitalis, and ammonia. This brought the renal excretion up from two pints to nearly four pints per diem, but this only kept the ascitic fluid at bay. She continued in much the same condition for about ten days, when she had a severe rigor, and acute broncho-pneumonia developed over both lungs. The prostration now became extreme, and I should be ashamed to state the amount of brandy that was daily administered, sometimes in very large doses at a time, to support the failing circulation. Meanwhile, but little attention was paid to the condition of the *abdomen*, but I noticed that it was gradually getting more flaccid, and finally, when the fever declined, we found that the ascitic fluid had entirely disappeared. Nor did it reappear again, and then only in slight quantity, until after seven and a half years' absence, during which time she enjoyed comparatively good health. The final termination of the case points most conclusively to the original trouble having been due to cardiac failure. After the fluid had disappeared from the abdomen I failed to find that alteration in the size of the liver one would expect with such a degree of ascites. Besides, owing to a prolonged rest almost entirely in bed, the heart rapidly recovered its tone, and, as previously stated, she afterwards enjoyed very fair general health, till about December, 1894. On her return to town, for the same reasons I have previously stated, Dr. Barlow kindly consented to look after her. It was during his absence, in December, 1894, that she sent for me. I found she had general bronchitis, the heart again being very tumultuous, and she was becoming progressively thinner. I advised her to take her old digitalis mixture. After that I did not see her again until July, 1895, when I found her very weak, with a faint mitral murmur, and albumen in the urine. About the middle of October, Dr. Barlow asked me to see the case with him. We found the lower limbs intensely œdematous, as well as the

flanks. There was also considerable œdema of the lungs. There could no longer be any doubt about the existence of the mitral murmurs, both systolic and diastolic, the former being especially noticeable. But the point of interest is that, with the history of the old attack of ascites and with the present general œdema, there was hardly any fluid in the peritoneum. The most that was noticed gave a dull percussion note a full two inches below the umbilicus.

CASE II.—A young officer about twenty-six years of age, serving with his regiment in India, was seized one night—though apparently previously in good health—with violent vomiting and purging; after remaining ill some time he was ordered to the military hospital in Australia. He now was seized with a voracious appetite, but at the same time there was progressive emaciation, whilst he noticed his belly had become fuller. An event also happened which no doubt subsequently governed the future action of events,—viz., a discharge of pus from the bowel. Before leaving India there had been a difference of opinion whether the illness was due to abscess of the liver or acute catarrh of the intestine. This discharge of pus seemed to confirm the former opinion. It was therefore decided to open the abdomen and search for the abscess. This was done, but no abscess was found; the liver was, however, found pale and shrunken. The wound in the middle line of the abdomen did not heal above the umbilicus, with the result that a ventral hernia developed, whilst a biliary fistula was also established. He then came over to England and placed himself under the care of his family physician, Dr. B. Johnson, who called in Mr. Treves, with a view to the possibility of closing the biliary fistula and dealing with the ventral hernia. In the first part of this lecture I have described his condition when he returned, and it was evidently impossible, in the water-logged condition both of his peritoneum and flanks, to attempt anything surgical, not even the tapping of the belly, but it was considered best (1) to place him under the best hygienic conditions; (2) to keep him constantly in the recumbent position; (3) to let him take a per salt of iron; (4) to live at the sea-side, and every fine day to be carried down on a stretcher and be all day on the beach. Although we felt little encouragement ourselves, still to cheer him we named a period of one year when the question of surgical procedure should be again considered. It was, however, some three or four months before that period had elapsed that he presented himself before us again, considering himself very much injured that he was not allowed to apply for a return to his military duties. The ascites was gone, also the œdema of the flanks and legs, the biliary fistula had closed, and the

cicatrix in the middle line had so far contracted that the ventral hernia could easily be controlled by a pad. He was evidently in a fair way to recovery. We begged hard, however, for another six months' rest, but I believe, after all, he resumed his active duties, as field artillery officer, within the year originally prescribed. In arriving at a right conclusion as to the nature of this case only two points require consideration,—viz., hepatic abscess and acute intestinal catarrh (with thrombosis of the portal vein). No doubt the discharge of pus by the bowel was misleading, nevertheless, supposing acute catarrh of the intestine, an ileo-cæcal abscess may as well have formed as an abscess of the liver, as we shall see in Case III. Besides, Murchison states that in abscess of the liver the organ is enlarged and is always hyperæmic, never pale and shrunken, which Von Schueppel¹ declares, together with ravenous appetite and progressive emaciation, to be one of the signs of blockage of the portal vein by a thrombus. It was no doubt owing to the rapid absorption of the clot or its contraction that recovery took place, aided by fine sea-air and a vigorous youthful constitution. He has been at his regimental duties now some five years without any recurrence of the ascites, except a very slight return for a few days after a severe fall in the hunting-field, which might have caused temporary displacement of the contracted clot.

CASE III.—A pallid, ill-nourished young man, of about twenty-two years of age, was admitted under my care into George Ward of the London Hospital, suffering with perityphlitis. The ordinary treatment by opium and daily enemas was adopted, and in a fortnight he was decidedly better. His temperature, which when he first came in averaged 102° F., had dropped during the second week and beginning of the third to a steady range of 99° to 100° F., and the stools were beginning to acquire a normal consistence, when in the middle of the third week he had a rigor, and the temperature rose suddenly to 104° F. and also suddenly fell, but not to the former level, but remained between 100° and 102° F. The cause of the rigor could not be accounted for then, and it did not seem to be followed by any immediate bad consequences. But about eight days later, after making a careful examination of the abdomen, it was found that the peritoneum contained fluid above the level of the umbilicus, and also that there was increased pain on making pressure over the ileo-cæcal region. I therefore pointed out what had most likely happened. The rigor was the constitutional evi-

¹ *Cyclopædia of the Practice of Medicine*, vol. ix., *Diseases of the Liver and Portal Vein*, ed. 1880, William Wood and Company, New York, p. 797.

dence or signal of the detachment of a clot, which was carried by the intestinal veins to the portal vein, causing occlusion of some large branch, whilst no doubt some foci were lodged in the neighborhood of the original ileo-cæcal abscess, which might require operative procedure, and might happily find an exit by the bowel. With respect to the portal obstruction, the thrombus might break down and form an hepatic abscess, which could be treated in the usual surgical manner. But it was more likely if the clot was large and single, and fixed in a main branch of the portal system, that the ascites would increase, but that in time the deep collateral circulation would be established and the ascites diminish, and also probably the clot would contract and allow a free circulation through it. Both events happened. For a time the ascites continued to increase, but it was never urgent; then it gradually began to decline, and after a considerable interval of time, a great part of which was spent in a convalescent hospital, the abdomen was entirely free from fluid. Meantime there was much pain and tenderness in the ileo-cæcal region till, after a good deal of pricking pain, he passed some stools which contained shreds, small blood-clots, and pus. After this the swelling and tenderness in the ileo-cæcal region subsided, and when I last saw him, he was in perfect health. The medical treatment was practically *nil*. At first the bowels were kept open by enemata and the pain relieved by opium and constant fomentations. No special treatment was adopted for the relief of the ascites. Towards the latter part of his stay in the hospital and at the Convalescent Hospital his bowels were kept open by taking every morning on rising a dose consisting of magnesium and sodium sulphate, half an ounce of each. A consideration of this case, as compared with the one preceding, shows that the ascites in both proceeded from the same cause,—viz., a thrombus occluding the portal vein, though the severity of the first case greatly exceeded that of the last.

VARIATIONS IN THE CLINICAL COURSE OF CROUPOUS PNEUMONIA.

CLINICAL LECTURE DELIVERED BEFORE THE ST. CHARLES COUNTY MEDICAL
SOCIETY.

BY G. BAUMGARTEN, M.D.,

Professor of the Practice of Medicine in the St. Louis Medical College, Washington
University.

GENTLEMEN,—At the bedside the individual case of sickness proves almost always to differ from the typical description in the text-book. It is because the picture constructed in the books is an abstraction, a norm, the average of many cases, but never a case. The peculiarities are so manifold that they have led to the grouping of cases into endless subdivisions,—which seems to me unprofitable. It is better to study the anomalies in the course of a disease and their underlying conditions than to lay down a number of varieties to which nature still refuses to conform. Each case should be allowed to teach its own lessons.

I shall attempt in this lecture to illustrate the peculiarities of cases of lobar pneumonia by brief histories in which stress is laid on the deviations from the typical course.

The cases I shall present to you are, in first line, those of genuine croupous pneumonia, in which the diagnosis was not at all doubtful. Starting from the well-known typical picture of the pneumonia of young adults, it is rare, indeed, to miss one of the cardinal symptoms entirely; but not one of them is absolutely constant, not even the most conclusive of them all,—the rusty sputum. This is sometimes absent, not only in cachectic patients, but also in previously vigorous persons. In other cases it is very infrequent, occurring but once or twice in the whole course of the illness, and therefore may be overlooked. In a case of repeated extension of the pneumonic process, each new invasion was attended by only one or two sputa of bloody tinge. On the whole, however, I regard the scanty, slightly yellow, extremely sticky fibrinous sputum as quite characteristic enough without the rusty color, and this sputum at least is seen, if the patient expectorates at all.

It happens occasionally that the physical signs—crepitus, percussion dulness, bronchial breathing, increased vocal resonance and fremitus—are all wanting,—viz., when the local disturbance is confined to a small central focus. In this case the diagnosis is based exclusively on the rational symptoms and the sputum. Sometimes these leave no doubt, but more often the positive diagnosis is impossible under these circumstances, or possible only after the crisis.

In regard to the physical examination, I would like to call your attention to one peculiarity. You know that just outside of the area of distinct dulness the percussion note is commonly tympanitic; and the area of this tympanitic resonance is of very various extent in different cases. Now wherever this area is of considerable extent the case is apt to be attended with general disturbance of unusual intensity. By common consent, the severity of a case is not gauged by the size of the hepatized portion of lung; but when the tympanitic percussion sound is heard far beyond the limits of the area of consolidation, I have always noted high fever, great dyspnoea, very hurried respiration, and danger to life. I once had under observation a boy of fourteen, H. S., in whom the signs of hepatization were confined to a part of the right lower lobe, but the percussion note over the remainder of the right lung, anteriorly and posteriorly, was markedly tympanitic and of high pitch,—it was *not* so over the left lung. Dulness in front was not distinct; on the back it reached up to the lower angle of the scapula. In this region only was heard the bronchial breathing; here only the crepitus of resolution; to this region had been confined the pain of the first stage. Over the entire right lung above this was heard in spots a rough, in other spots a faint, vesicular murmur, but nowhere the normal respiratory sounds, and only here and there scant, large-sized râles. This behavior continued unchanged from my first observation (on the third day of the disease) to the day of complete defervescence (the eleventh). The fever was intense, 103° to 104° throughout, once $106\frac{1}{2}^{\circ}$ F.; great prostration, absolute anorexia, frequent delirium, and great mental apathy; respirations often over 60, once 68 per minute,—more than one breath to two pulses. Heart failure sometimes seemed imminent. And this is by no means the only case in which I have noted the coincidence of a large tympanitic area with dangerous general symptoms.

An important factor in determining an anomalous course is the fever. In judging of its vagaries let us start from the modern conception of the disease as an *acute infectious fever caused by the diplococcus of Fränkel, making local lesions in the lung in the shape of an exudative*

inflammation,—a parallel, in a general way, to other typical self-limited fevers. It yields a typical temperature curve, which consists of a sudden abrupt rise reaching its acme in a few hours and therefore accompanied by a chill,—a febrile period of about five to nine or more days with irregular remissions,—and then a sudden drop to or below the normal. This crisis determines the virtual end of the disease; the local lesions are gradually repaired and in most cases leave no trace behind. This is so clearly the course of an infectious fever that it was interpreted as such before its bacterial cause had been discovered. With the cessation of the fever the danger to life is removed, and the extent of the lesion is of minor importance.

I have never seen a case in which fever was entirely absent. But I remember three cases of very low temperatures throughout; two of these were ambulant cases, in spite of well-marked local lesions,—one a man of advanced age who never kept his bed at all, the other a man of thirty whose temperature never rose above 100.6° F.; of the third case I mean to speak later on in detail.

In the majority of my cases the temperature made the typical run. In two only have I seen *extreme temperatures*; in the boy of fourteen already mentioned, who recovered, the maximum was 106.5°; in an older man, the temperature reached 107.3° several hours before death.

This latter case is of some interest. Mr. J. W. P., aged fifty-six, of vigorous build and rather stout, had attended an exciting meeting of financiers in a town in Arkansas early in May, 1887. When he returned to St. Louis he felt nervous and weak. A few days later a skin eruption appeared, May 9, on the face, May 10, on the neck and chest, finally, on May 11, it extended over the whole body; it was declared to be R \ddot{o} theln (*rubella*). The accompanying fever was high. His attending physician, Dr. Bryson, favored me with these figures. May 8, A.M., 101°, P.M., 103° F.; May 9, A.M., 100°, P.M., 104°; May 10, A.M., 102°, P.M., 103°; May 11, A.M., 103°, P.M., 103°; May 12, A.M., 102°, P.M., 103½°; May 13, 103½°, P.M., 103°.

From this time I attended him in the absence of Dr. Bryson. On May 12, and still more on the 13th, the pulse had become very frequent and very irregular, and the patient complained of præcordial anxiety. Of the exanthem only traces remained. Yet the fever continued unabated, and his general condition was bad; the urine was free from albumen; there was great mental apathy and considerable somnolence. On the 13th a congestion of the face and ears began, and remained conspicuous during the next few days.

On the 14th a dry, distressing cough set in, without expectoration;

in the evening I discovered, under the guidance of a severe pain in the left side, a pneumonic spot in the left lower lobe posteriorly by the presence of crepitus. On the 15th, the crepitus was replaced by loud bronchial breathing and the spot gave distinct dullness on percussion; a few rusty sputa were raised with great difficulty. The pulse had now become regular, but very soft, the cardiac sounds feeble and distant. The temperature remained high and rose in the night of the 16th to 104°. At four P.M., of the 17th, the general condition grew very serious, the patient somnolent and rather confused, the dyspnoea extreme, and the thermometer rose at five P.M. to 105.6° F.; at six P.M. to 106.6°, and at nine P.M. to 107.3°, in which temperature the patient died in collapse,—*i.e.*, on the tenth day of the disease, the fourth of the pneumonia.

Here we had, then, a croupous pneumonia complicating Rôtheln (or measles), probably with a fat-encumbered heart (?) I need scarcely remark that secondary pneumonias are wont to be less typical and more severe than primary cases.

The much-desired defervescence by crisis occurred in about one-half of my recorded cases, and that only in primary pneumonias, never in secondary and complicated cases.

Great ups and downs of temperature always raise suspicion either of complications or of extension of the local process. When the process invades new territory, or the other lung, a new rise of temperature is almost certain to take place. For example,—

H. P., a youth of sixteen, had an initial chill; on the next day the temperature rose to 104° F., there was crepitus in the right lower lobe, rusty sputa; on the third, percussion dullness, bronchial breathing, temperature falling to 101°, improvement in general symptoms. But late in the evening a rigor occurred, with acute pain in the left side; on the next morning the temperature had risen to 104.5°, the signs on the right side were the same as before, over the left lower lobe posteriorly the percussion sound was tympanitic and slight râles were heard. On the fifth day there was dullness on the left side and bronchial breathing, but the pain had disappeared, the sputa were no longer bloody, the temperature fell, and on the sixth day arrived at the normal point, with profuse sweats. (This was before the day of modern antipyretics.) The local lesions disappeared in a few days, the temperature never reaching 100° again.

This relation between the temperature and the paroxysmal extension of the lung affection was still more marked in the case of a colleague, aged forty-two, who fell sick late one evening with agonizing pain in

the right side and a violent chill, followed by a temperature of 104° . By the next evening a small pneumonic patch was demonstrable in the right lower lobe; *one* rusty sputum was expectorated. Temperature, 102.5° and 100° ; third day, 99.6° . On the fourth it rose to 103.4° , accompanied with severe pain in the left side and epigastrium, and a single characteristic sputum; an extensive pneumonic infiltration developed in the left lower lobe, with the complete array of physical symptoms. Again the temperature fell by the sixth day to 99.8° ; but on the evening of the seventh it rose once more to 103.4° , and under most violent pains in the epigastrium, the pneumonic focus in the right lung had suddenly extended forward and now involved the entire lower and middle lobes. This third invasion also was marked by not more than three or four glutinous rusty sputa. Resolution took place in each focus distinctly by itself, in the order of its coming, as could easily be traced by physical examination. There was no distinct crisis; the temperature varied from 99.6° to 100.6° , and reached the normal point on the thirteenth day. The patient had had, as it were, a treble pneumonia, with three separate rises of fever.

Coincidence of renewed fever with abrupt extension or new attack, before the original pneumonia has terminated, is so frequent that I am tempted to infer from any sudden considerable rise of temperature that new portions of lung are involved, even before the physical signs show it.

"Intermittent pneumonia" is spoken of: I have never seen any pure intermissions. That such remissions and exacerbations in the general course as I have just exemplified have anything to do with the periodicity of malaria seems entirely devoid of proof. I would interpret them, as I said, as attendant upon paroxysmal extensions or, as it were, new infections; in the case of H. P., for instance, I am convinced that the original pneumonia which localized in the right lung was about to end critically on the third or fourth day, when the pneumonia of the left side developed, which in turn rapidly ended by crisis. The result was a repeated move up and down of the temperature curve. The same is true of the case last related.

Certain it is that a watchful observation of the temperature is a valuable aid in the continuous diagnosis of the case, and of great help in the care of it.

An interesting question is, How soon can the local lesion be recognized? To find it early is a great help, evidently, to an early diagnosis, particularly in those instances when the sputum is absent. (Of course, I do not refer to cases of acute onset, where the chill, pain, breathing,

cough, and general behavior allow us to guess at the diagnosis at a glance.) The case may be less pronounced, and the physical signs absent; a hepatization in the centre of a lobe may fail to change the percussion note; even a peripheric focus is discovered by percussion only when it is of some size; and knowing this, as well as that the extent of pneumonic infiltration and the intensity of the disease do not run parallel, we need not wonder that the exact time when consolidation takes place cannot be determined in every instance. Hence, the *physical signs are not always the earliest nor the most important of the symptoms of pneumonia, and not always available for an early diagnosis*. Here is a case, for example, in which it remained doubtful whether the pneumonia was secondary to a bronchitis or whether the original infiltration was concealed in the early stages of the sickness and detected only after an extension. A lady, of nearly fifty, Mrs. N., of gouty constitution, with a tendency to eczemas, who was said once to have had a slight albuminuria, was taken sick in New York City, December, 1886, with a severe chill followed by some fever and cough. She arrived in St. Louis some days after. There was an acute nasal and bronchial catarrh, with frequent cough, copious muco-purulent expectoration, and a fluctuating temperature of 100° to 103° F. The fever, the severe illness, the insomnia, the persistent cough which was frequent and harassing, notwithstanding the free and easy expectoration, were rather remarkable. Through the eighth to tenth days of the disease, counting from the initial chill, the fever rose, and a pain in the left side, which had been slight before, became distressing; on the next day I found a pneumonic spot in the left lower lobe by percussion dulness, with tympanic resonance in considerable extent upward and forward, and a circumscribed area of crepitation. On the following day the mucous sputum was streaked with blood. The crepitation was now confined to a narrow strip about the level of the lower angle of the scapula extending into the left axilla; below this strip bronchial breathing and flatness on percussion; above it, the tympanic resonance extended into the very apex. On the right side there were some large, moist râles and normal percussion sounds. The case now progressed like an ordinary pneumonia; distinct rusty sputa were raised; resolution took place gradually, without crisis, and convalescence was rather tardy.

It is hard to believe that this was not a pneumonic infection from the first. Pneumonia was prevailing in New York City at the time; the initial chill favors the idea; when the fever rose anew and the local lesions became manifest, there was no chill; I inferred, therefore, that a pneumonia of small extent coexisted with the bronchitis from

the very first. I have since had the suspicion, however, that this was a streptococcus pneumonia, with the characters of which I was not then familiar.

Double pneumonias present this straggling and delayed course more frequently. The second lung is often seized from two to four days later than the first, and in some instances the progress of the inflammation is quite irregular, as exemplified in one of the cases already related, and also in the following :

C. S., aged sixty, a gentleman of small build but hitherto excellent health, returned home one February afternoon from a walk in the face of a cold, raw wind, had a slight chill, and complained of great pain in the *left* side and especially down the inner aspect of the left arm ; the pain was relieved by hypodermatic injection of morphine and applied heat, but returned the next, and still more intensely on the fourth day. The patient seemed well otherwise, though weak. Not until the eighth day did fever set in, with loss of appetite, rapid breathing, a slight, dry cough, and the patient was only now persuaded to keep his bed. Physical examination of the chest gave negative results, as before.

On the ninth day he was seized with pain below the *right* nipple ; temperature 100°, respiration 40. In spite of the lack of physical signs I now made a diagnosis of pneumonia. During the night and day following the patient had paroxysms of violent pain ; temperature, 99.2° ; pulse, 96 ; respiration, 48 ; he raised a few tenacious yellow sputa ; percussion and auscultation still gave no clue. On the eleventh day a small area on the right from the nipple line outward gave a dullness on percussion, a rough and in some places faint respiratory murmur, and now and then crepitation. On the twelfth the general condition improved, the pain subsided, the breathing became more quiet, and the temperature dropped to 99.4°.

On the thirteenth the pain had ceased ; the temperature was 99°. On the back, over the right lower lobe, could be heard a moderately dull, somewhat tympanic, percussion sound up to the angle of the scapula, and over this area could be detected bronchial breathing and increased vocal fremitus. The first sanguinolent sputum was now raised, glutinous, orange-colored, with streaks of discolored blood. During the next few days, the temperature was 99° and 99.2°. On the seventeenth some crepitant and subcrepitant râles could be heard on the back over the right lung.

But new symptoms now set in again on the *left* side. On the eighteenth day, without any rise of fever (temperature, 99° ; pulse,

78 ; respiration 24), pain returned on the left side and, posteriorly, some fine crepitant râles ; in the night, violent pain was complained of radiating from the left half of the epigastrium to the left shoulder and arm, making breathing painful and superficial. To these symptoms were added, on the twentieth day, faint bronchial respiration, and a soft friction sound.

This being a case in which, as you will have observed, the temperature curve ran usually low, I will read the record of the next few days :

Nineteenth day, temperature, $99\frac{1}{4}^{\circ}$ F. ; pulse, 80 ; respiration, 32. Twentieth day, A.M., temperature, 100° ; pulse, 100 ; respiration, 40 : P.M., temperature, 101° (maximum) ; pulse, 100 ; respiration, 38. Twenty-first day, temperature, $99\frac{1}{4}^{\circ}$; pulse, 98 ; respiration, 25. Twenty-second day, temperature, 100° ; pulse, 94 ; respiration, 23. Twenty-third day, temperature, 98° ; pulse, 76 ; respiration, 17. On this day the pain had ceased entirely, and the patient experienced the first refreshing sleep. Convalescence seemed established, when suddenly, on the twenty-fifth day of the illness, a violent pain again attacked the *right* side ; the spot in the right anterior inferior region of the lung, which had been dull on percussion on the eleventh to the thirteenth day, again showed dullness and also a distinct friction murmur on expiration as well as inspiration. Although the fever did not rise materially, the pulse now became frequent and small and the general condition seemed alarming. On the following days, however, the physical examination pointed to improvement in all the affected localities. Very feeble, with thread-like pulse and faint heart-sounds, the patient at last entered upon a slow convalescence. (He has been in fair health to this day.)

This case I interpret as a pneumonia which began in the *left* side with either a very small or a centrally located focus. On the eighth day there was added to this a pneumonia in the lower part of the *right* middle lobe anteriorly, gradually extending backward, where it could be detected on the thirteenth day. On the eighteenth a new extension took place on the left, reaching forward and involving the pleura. A week later the pleura over the hepatized area of the right side was also affected ; but in both cases without liquid exudate. The temperature in this case, as you will have noted, never rose above 101° .

You may also have observed that, in this instance as well as some others I have mentioned, the seat of the *pain* does not correspond to the seat of the pneumonic lesion. Although only a negative point, it is worth remembering ; the sometimes excruciating pain in the epigas-

trium, of which some patients complain on the first or second day, points to a localization of the pneumonia in the base of the lung, demonstrable on the back rather than the front, without indicating which lung, right or left; and the pain below the axilla and in the arm rather points to the middle or upper lobe.

Another detail which the case last related calls to mind is the complication with pleurisy. This must always be looked for. Whenever the site of the hepatized area is on the periphery of the lung, whether at the back, sides, apex, or base, the pleura is necessarily involved in the inflammation, and the pain is usually acute. But this does not necessarily lead to a fluid exudate. The cases are not rare, however, in which pneumonia is attended or followed by a large pleuritic effusion, ordinarily sero-fibrinous, but in secondary pneumonias often purulent.

Now permit me to say a few words concerning the pneumonia caused by the streptococcus. It certainly differs from the ordinary croupous pneumonia in many essentials. Clinically, it has been known less than ten years, and we have become familiar with it during the recent repeated epidemics of influenza. For it is one of the forms of infection to which a grippe patient is particularly liable. Osler may be correct in saying that there is "nothing special or peculiar in the pneumonia [of influenza]; all the anomalies which have been mentioned as occurring in influenza are found in any large series of cases." But it is evident to me that the anomalous cases which are so dangerous to the life of influenza patients are precisely the streptococcus infections; and Osler, on the same page, describes them in a picture that, in my observation, fits exactly those cases in which bacteriological search has found the streptococcus, alone or with the diplococcus pneumoniae. He says, "Sometimes the symptoms may at first be obscure, and the pneumonia atypical. Thus, after an initial rigor, with some dyspnoea and high fever, the local signs may be obscure, and it may not be until the third or fourth day, or even later, that the physical signs of a pneumonia are detected. The sputa may not be rusty until the fourth or fifth day. The crisis may be deferred or the defervescence may be by lysis. . . . Abscess of the lung may follow,"—and I may add *gangrene*. Such cases as these he has seen, among others,—and I could not describe the streptococcus cases I have seen more graphically or in better words. There must be added, however, some other differences, which sometimes enable us to make a diagnosis before microscopic examination of the sputum confirms the suspicion. There is some approach in the physical signs, and in individual cases, to broncho-pneumonia, and the general course of the disease is often more nearly that of a septic

process than a genuine croupous pneumonia. While the latter more frequently invades the lower lobe, the streptococcus pneumonia is more frequently found in the upper lobe, not the apex, but rather its lower part, the hepatized focus being often found between the lower angle of the scapula and the axilla ; it is apt to extend its area irregularly and in a creeping or migratory fashion ; and when it invades both lungs, as it often does, the physical signs in the two sides may vary considerably ; large mucous râles are often found side by side with crepitus and obscure it, especially during resolution ; different portions of the lung may show different stages of the process at the same time. The sputum is muco-purulent at the outset ; and when it becomes bloody and glutinous, the color is more often dingy red or chocolate than rusty and continues to be abundant. Now add to this the often insidious beginning, the irregular fever attended with chilly sensations, rigors, and sometimes profuse sweats, and finally the failure of the crisis, and you have a picture *common to many cases* which are markedly different from the text-book type of pure pneumonia.

PLEURITIC EFFUSION; HYDROTHORAX; LOBAR PNEUMONIA.

CLINICAL LECTURE DELIVERED AT THE CINCINNATI HOSPITAL.

BY GEORGE A. FACKLER, M.D.,

Director of the Laboratory for Experimental Pharmacology at the Laura Memorial Medical College, and Clinical Lecturer on Internal Medicine at the Cincinnati Hospital, Cincinnati, Ohio.

GENTLEMEN,—Those of you who have been regular attendants upon the clinics have observed that a certain method has been adhered to in the study of the cases presented. One of the prime postulates of clinical instruction is to inculcate the necessity and benefit of methodical study. You may take it for granted that your teachers have but one object in view,—viz., to create in your minds an indelible picture of the case in hand, in order that, when you enter upon the practice of medicine, you may readily recognize its duplicate among those submitted to you for diagnosis. Hence, in the majority of instances our lectures are introduced with the reading of the previous history and a view of the subjective symptoms of our patients. In the history of hospital patients as recorded by the resident physicians, all statements extraneous to the entity of their cases are naturally eliminated. The chapters on family and previous history are constructed largely out of the statements furnished by the patient and his recital of subjective symptoms. They correspond to the story with which our private patients regale us during the early part of our first interview, devoid, however, of superfluous verbiage, exaggerations, and misrepresentations.

It is my purpose to-day to present three patients, whose cases we will study in order that we may establish a positive diagnosis without the aid of any previous history or subjective symptoms. We will ignore all the manifestations of disease perceptible only to the senses of the patients. They shall serve as illustrations of a large class, in whom, though they be deaf and dumb, halting and blind, hysterical

and morbidly sensitive, or encompassed by the darkness of idiocy or imbecility, the educated physician, with his knowledge of the organs and their functions in health and disease, with his well-trained senses of touch, sight, and hearing, assisted by instruments of precision, chemical and microscopic analyses, is able to discover any abnormal condition.

In order to save time and avoid unnecessary detail, I will omit all reference to that part of the examination as a result of which the site of the disease has been located in the thoracic cavity. To detect any digression from the normal condition of the chest and viscera, or of their functioning activity, it is mandatory that you should be thoroughly conversant with that condition. It is beyond my province to deliver a lecture on the anatomy and physiology of the parts involved. The requisite knowledge you are expected to have imbibed from your lectures in the colleges, the demonstrations in the dissecting-room, and your reading of text-books. Permit me to suggest to you as a most profitable entertainment the demonstration and verification of your text-book knowledge upon each other. Get together, a coterie of healthy fellows, and practise percussion and auscultation upon each other. One glance at a flower will leave a more lasting impression on the memory of a botanist than its description reread a hundred times by one unfamiliar with that science. The master *virtuoso* will not join in the praise of a violin, though its mould and music have been lauded to the skies, until he passes the bow over the strings himself.

Without entering upon a minute description, I desire to designate a few landmarks, which will guide us in determining deviations from the normal. Our conception of the healthy thorax rests upon the idea of symmetry, any marked deviation from which arouses a suspicion of existing disease. In health, then, the general configuration of the two halves of the thorax should be alike. The true ribs should leave the sternum at increasing angles from above downward, and the interspaces should not be perceptible except in the lower portion of the chest. The scapulæ should lie flat against the thoracic wall. The respirations should be regular in rhythm, and in the adult about sixteen to twenty a minute, inspiration representing an active, expiration a passive act. During inspiration there should be a noticeable elevation of the sternum and ribs, the latter by a movement upward and outward. Furthermore, because of the contraction of the diaphragm, the abdominal viscera being depressed, the abdominal wall especially in the epigastric region should become more prominent. The impulse of the heart's apex against the chest wall should be observed in the fifth left

intercostal space, a little to the right of the mammary line. Palpation should not elicit pain, localized or general, and vocal fremitus should not materially vary over different parts of the lungs. With the exception of that obtained over the sternal and præcordial regions, the percussion note should be almost uniform. A transverse line intersecting the mammary line at the sixth rib, the axillary at the eighth, and the scapular at the tenth rib, corresponds to the lower border of the lung as ascertained by percussion. By auscultation normal vesicular breathing is heard wherever the lung is in juxtaposition with the thoracic walls. Wherever the trachea or larynx approach the wall bronchial breathing may be heard. As stated before, this curt exposition of normal manifestations is indulged in on the presumption that your general knowledge enables you to comprehend their significance when adapted to the cases at hand.

CASE I.—Our patient is a young man, probably thirty years of age. His general appearance would suggest the idea that he has been ill for some time; not because we observe marked emaciation, for this does not exist, but the ease with which we can outline the separate muscles of the arms and mark the clavicle and ribs should arouse a suspicion of a lack of adipose tissue. The muscles are somewhat flabby, not as resistant upon contraction as you would find them in a healthy laborer. They have evidently become relaxed because of non-use and, perhaps, because of impoverished nutrition. The skin is moist and pliable, not hot and dry as we would find it in a febrile state. Our assumption of an afebrile condition is verified by the use of the thermometer, which records 99° F. The color of the skin and the mucous membrane is not that found in anæmia, and yet you do not detect the healthy glow which accompanies normal circulation in these parts. It is a condition which we might aptly describe as slight anæmia. The absence of cyanosis precludes the assumption of deficient aëration of the blood. As he moves about and changes posture you fail to note any alteration in the expression of his features indicative of pain, or any sudden contraction or relaxation of individual or groups of muscles, which accompany the instinctive effort to put painful parts at rest. Respiration is tranquil and twenty per minute. Let us, however, examine the contour and movements of the chest more closely. Viewing the anterior aspect you readily detect a difference between the two sides. The left side of the thorax expands and contracts regularly and fully; but on the right side you observe retarded movement of the lower section, although it is distinctly larger than the corresponding part of the left. In fact, the intercostal spaces are obliterated, while those of

the other side can be clearly mapped out. Turning the patient about, the same asymmetry in form and movement of the thoracic walls is discernible posteriorly. I would call your attention also to a slight spinal curvature, a scoliosis towards the right side in the lower dorsal region.

As the result of inspection we would, therefore, conclude that our patient has been ill for some length of time; that he is in a fair state of nutrition; that he is certainly not suffering with any acute febrile disease; that there is some impediment to the proper functioning activity of the right lung, due either to the presence of fluid in the pleural cavity, an affection of the lung-tissue resulting in enlargement, or an enlarged liver impinging upon the territory involved.

Forcible palpation fails to elicit any painful loci, and careful, delicate palpation discloses no difference in vocal fremitus between the two sides until, anteriorly, we reach the fourth rib, when the fremitus grows weaker on the right side, to disappear entirely below the fifth rib. A like change is experienced while palpating along the side and posterior aspect of the right half of the thorax, the superior border of the area, in which vocal fremitus is absent, being somewhat higher in the axillary line. We may assume, then, that there exists no inflammatory condition of the chest wall or pleura, and claim that we have secured corroborative evidence for the existence of the impediment already detected by inspection. In addition, we are now inclined to suggest the probability of the presence of a fluid in the right side of the chest, because a solid medium would transmit vibrations to our hands more readily or in increased degree.

Let us, however, not depend solely upon the sense of touch in our efforts to discover that which is beneath the surface. Let us call to our aid the sense of hearing. By percussion we may remove the doubts still existing. If I percuss rapidly from above downward on the left side no appreciable change in the note is heard except in the præcordial region. It is not difficult to distinguish a decided alteration in the percussion notes as I repeat the manœuvre on the right side. Even at a considerable distance you mark the contrast between the resonant sound over the subclavicular region and the absolutely flat percussion-note elicited below the nipple. Now, going over the right side more carefully, what do you hear? A splendid response in the subclavicular region, a note possessing a peculiar, tympanitic quality, especially along the external border of the sternum as far down as the fourth rib, and then a sudden transition into a non-resonant, dull sound. It is flat down to the costal arch and beyond to the inferior margin of the liver.

Extending the examination towards the back we secure only the same result over the lower section of the thorax. If we now attempt to outline the upper border of the dull area and trace with the pencil a line on the skin corresponding to that which divides resonance from dullness, you observe a peculiar but significant curve with its convexity upward and highest in the axillary line. This curve is significant because in ninety-nine out of one hundred cases it is pathognomonic of a pleuritic effusion and in marked contrast to the horizontal line which marks the upper border of the fluid in hydro-pneumothorax or the diagonal line below which dullness is detected in lobar pneumonia. Percussing anteriorly towards the left side the dullness is found to be continuous with that of the cardiac area, and that the normal left boundary of cardiac dullness has been moved outward, perhaps, one-half inch. Thus, in the absence of vocal fremitus, the dull, flat percussion area with its peculiar superior margin may be regarded as a positive symptom of pleuritic effusion.

Perhaps you still entertain some doubt as to the correctness of the diagnosis. I will ask one of the senior students to place his ear on the right side of the chest at a central point of the dull section. Let him state what he hears. Nothing. No respiratory sounds are heard except in close proximity to the line traced on the skin. Here faint vesicular breathing is discernible. Auscultation, therefore, also demonstrates that a poor conductor of vibrations is within the thoracic cavity. But the sceptic, who believes only what he sees, may be among you. We can satisfy him. I insert the needle of a hypodermic syringe into the pleural sac in the sixth interspace in the axillary line and draw into the syringe a fluid of a light, yellowish color.

Thus, without consulting the previous history or subjective symptoms, without any participation on the part of the patient, except changing his posture or uttering a few monosyllables during palpation, we have by inspection and palpation suspected, by percussion and auscultation believed, and by the use of the hypodermic syringe demonstrated the existence of a pleuritic effusion. This patient has had an acute pleurisy on the right side. The acute symptoms have subsided, but the fluid that was exuded has remained unabsorbed to a great extent.

CASE II.—This patient is a man who has passed beyond the limit of threescore years and ten. You who have been close observers of the alterations in shape which the chest undergoes will even now have made a diagnosis of the case. You have noticed the emaciated condition indicative of prolonged illness involving nutrition. You have

remarked the dusky hue of the skin and the cyanotic color of the lips. In your rude analysis of the case you have been chiefly struck by the labored breathing of the patient. The dyspnoea is of a peculiar character, the respirations not being increased in rapidity, the inspiratory act being apparently performed only with the aid of the accessory muscles as manifested by the undue prominence of the sterno-cleido-mastoid muscles, the elevation of the shoulders, while the neck appears to grow shorter and the skin in the supraclavicular spaces retracted. And yet with this extreme inspiratory effort the chest wall scarcely moves. Each inspiration is separated from the succeeding one by a long expiration. By actual measurement we find a difference of only one-half inch between the circumference of the chest in full inspiration and that secured after the patient has been asked to permit all the air contained in the lungs to escape. The conformation of this thorax, hence, undergoes but slight variation during the respiratory act, and, with the patient at rest, appears to be fixed in extreme inspiration. As you look at the man from either side you also detect a pronounced posterior spinal curvature. The spinal column forms a decided uniform arc, the highest point of which is at about the level of the sixth dorsal vertebra. Because of these attributes we term this a barrel-shaped chest, and you have correctly surmised that we are dealing with a case of emphysema. Although it appears to be a clean-cut, simple case, let us indulge in further physical examination before passing to the next patient. By palpation we expect to discover but little, if any, variation from the normal as respects vocal fremitus. Here, however, strange to say, vocal fremitus is absent in the lower portion of each side. This suffices to arouse our suspicion as to the existence of some complication. Hence, we resort to percussion. Percussing carefully from above downward, what do we ascertain? Anteriorly a loud, resonating tympanitic note over the upper section of each lung, the resonant area ending abruptly, however, at the third rib on the left and at the fifth rib on the right side. As in the first case, percussion and auscultation furnish positive evidence as to the presence of fluid in the pleural cavity. In contrast to the first, this case is one in which both sides are involved. The same peculiar curve of the line limiting the superior border of dulness may be traced on the surface. Are there any other points of differentiation between the two cases? Most assuredly. In the first, the affection was unilateral, here bilateral. In the first thoracic deformity was scarcely perceptible, here marked. In the first the respiratory rhythm was not disturbed, while here we have marked emphysematous breathing. Since the patient is evidently

suffering from the dyspnoea occasioned by the accumulation of fluid, especially in the left pleural sac, we will aspirate that side. A large quantity of fluid is withdrawn, by measurement fifty-four ounces. Its color is much lighter than that secured in the first case, and by comparison we observe that it does not coagulate as readily as the other. It has more of the characteristics of a transudation than of an exudation. This is then a case of hydrothorax, a dropsy of the pleura. If we should investigate the previous history of our patient we should probably hear of no acute attack of pleuritis. Hydrothorax develops usually in consequence of the existence of pathological conditions underlying dropsical effusions in other parts of the body. Another interesting feature in connection with this case, therefore, is the absence of such etiological factors, so that we are compelled to ascribe the result to a long-standing emphysema. Additional proof of the dropsical nature of the affection is the rapid accumulation of fluid after aspiration. Only ten days ago sixty ounces of fluid were withdrawn from the left pleural sac.

CASE III.—The fact that this patient, a man about fifty years of age, is brought before you lying upon the clinic bed would suggest to you the importance of rest in the treatment of his case. Rest is enforced whenever we fear or know that muscular exertion would result in an aggravation of the symptoms. The patient was told to assume the posture in bed most grateful to him, and not to be induced by these surroundings to change it into any in which he would experience pain or discomfort. As you see, he lies with his right side raised from the bed free from pressure. In order not to consume valuable time, I would state that, as in the other patients, the site of the disease is confined to the thorax. He prefers to lie upon the left side, because in a reversed posture he probably would experience pain or some distress in respiration, as dyspnoea. If for the former reason, we would assume the existence of some inflammatory condition of the right thoracic wall or pleura; if for the latter, an involvement of the left lung as a result of which its respiratory capacity was decreased. Respiration is a little more rapid than normal, but far from that characteristic of dyspnoea. We will ask him to lie upon his right side. You observe no change in his behavior or his facial expression indicative of pain. His breathing does not become "catchy," as it would if compression of the right side was attended by pain. But he breathes more rapidly and apparently with greater effort. We may conclude, hence, that freedom from pressure upon the right side, as insured by his first position, is instinctively sought for because therein respiration approaches

nearer the normal, and that the abnormal condition is located in the left lung. We do not see any evidence of prolonged suffering. He is not emaciated nor anæmic. On the contrary, his cheeks are ruddy, their color rather simulating a hectic or feverish flush. Upon closer inspection we find that the color is in part due to such causes, but in large part to permanently dilated superficial blood-vessels, which with other symptoms may be attributed to the excessive indulgence in alcoholic beverages. Inspection, therefore, would lead us to suspect the existence of some acute disease of the left lung or pleura interfering with normal respiration, attended by a decided elevation of temperature, and occurring in a chronic alcoholic. I ask the patient to sit up, and he responds quickly and without manifestation of distress or pain. No marked difference in the conformation of the two sides of the chest is noticeable. Even with deep inspiration we fail to observe dissimilarity in the movements of the thoracic walls anteriorly, but posteriorly you can discover that the right scapula moves through a larger arc than the left, and that the lower section of the left side expands more slowly than the corresponding part of the right side. Deep inspiration is not painful. By palpation, again, do we fail to discover any variation in vocal fremitus between the two sides anteriorly, but in the inter- and infrascapular regions we are more successful. On the right side vocal fremitus is normal, but on the left it is increased within an area bounded below by the inferior margin of the lung, within by the spinal column, and above and without by a diagonal line starting opposite the spine of the scapula, running down and outward to intersect the axillary line at the fourth interspace and the mammary at the sixth rib. Remember that in the other cases vocal fremitus was diminished because of the presence of fluid. Here we would, therefore, suspect an increase in the density of the pulmonary parenchyma, which would insure better transmission of sound waves, —i.e., a consolidation due to lobar pneumonia, tuberculosis, or œdema. The evidences furnished by palpation alone speak in favor of lobar pneumonia, which is usually unilateral, whereas œdema is bilateral. Tubercular consolidation rarely begins in the inferior segments of the lung, but generally in the apices. Still, exceptions are numerous enough to warrant hesitancy in expressing a decided opinion. Percussion along the mammary lines elicits no dull sounds; on the contrary, the percussion-note over the left side anteriorly is so resonant as to justify us in regarding it as abnormal, a vesiculo-tympanitic resonance. Turning the patient about and percussing along the interscapular region of the right side, I find no evidence of abnormal conditions; but on the left

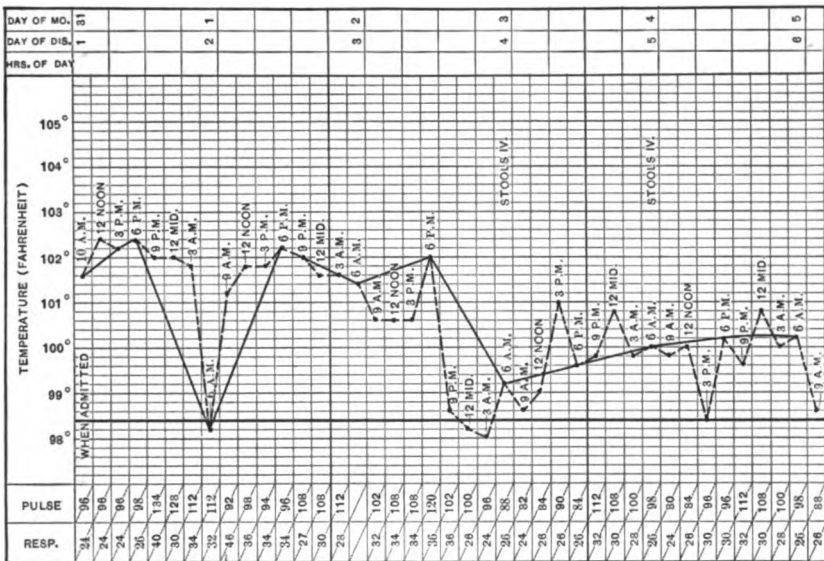
side a dull percussion-note is elicited over a considerable area. As I now carefully continue the examination in order to determine the outline of the dull section, you have no difficulty in establishing the fact that it corresponds exactly to that in which by palpation we secured increased vocal fremitus. Again do we trace the line dividing the abnormal and the normal part from a point opposite the spine of the scapula diagonally down and outward to intersect the mammary line at the sixth rib. Nor does the posture of our patient affect the site of this line. It remains fixed. You will appreciate the significance of this symptom if you but appeal to your knowledge of the anatomy of the parts and call to mind the location of the fissure which separates the two lobes of the left lung. Does it not correspond to the line drawn upon the skin of this chest? Hence, percussion and auscultation teach us that the disease is confined to the lower lobe of the left lung, and that one of its features is consolidation of the pulmonary parenchyma. Is it necessary to resort to auscultation in this patient in order to establish a positive diagnosis? Certainly not to differentiate from pleuritic effusion; certainly not to distinguish it from pulmonary collapse, in which but a moderate degree of dulness is found; certainly not from tuberculosis, against which speak the site of dulness and the general state of the patient. In œdema of the lungs we usually meet with a bilateral affection, and as in collapse the dulness is less marked. It might possibly be confounded with pulmonary apoplexy, a rare lesion, a case of diffuse pulmonary hemorrhage, a common symptom of which—viz., hæmoptysis—is absent.

All signs thus far brought out in this case point to the existence of acute lobar pneumonia, the inflammation being limited to the lower lobe of the left side. To remove the diagnosis without the pale of criticism confirmatory evidence of auscultation is required. Breath-sounds are not absent as in pleuritic effusion and pneumothorax. I cannot distinguish the peculiar liquid crackling of pulmonary œdema, nor the moist râles detected in pulmonary apoplexy, but broncho-vesicular respiration in the lobe involved, numerous crepitant and subcrepitant râles, with here and there submucous râles. These results of auscultation justify us in concluding that the diagnosis as suggested by those of palpation and percussion was correct, but that the stage of consolidation, during which bronchial breathing without râles is heard, is merging into the third stage, that of resolution, during which râles varying from crepitant to mucous make their appearance.

I show you here the masses of tenacious, grayish-yellow sputum expectorated by the patient. The rusty-colored sputum of pneumonia

so characteristic of the disease is furnished only in the first days of its history. Perhaps, if the sputum were examined under the microscope, pneumococci would be discovered. Although the diagnostic significance of these organisms is not equal to that of tubercle bacilli, still their presence accentuates the diagnosis. I refer to Fränkel's diplococcus, which is found in ninety per cent. of all cases of croupous pneumonia. It is, however, incorrectly termed "pneumococcus," since it is extensively diffused and not exclusively found in pneumonia. It is present in almost all cases of cerebro-spinal meningitis, pleuritis, peritonitis, pericarditis, endocarditis, otitis media, and numerous other

FIG. 1.



The record shows that on October 31, the day of admission to the hospital, the patient's temperature at 10 A.M. was 101.6° F., and that it wavered between this and 102.4° until November 1, at 3 A.M., when it experienced a precipitous fall within three hours to 98.2°. Pneumonia is "the" disease which often terminates by crisis, and as such the uninitiated would be apt to construe this decided and rapid deferescence. But the careful physician does not jump at conclusions, and in a case like this he will consult the record of respiration and pulse as a precautionary measure. You notice that the decline in temperature was not accompanied by a corresponding decline in pulse or respiratory rate. Such discrepancy should at all times cause you to doubt the permanency of the apparent improvement. A sudden elevation of temperature to 101.2° recorded at 9 A.M., reaching 102.2° at 6 P.M., demonstrates that we were dealing with a pseudo-crisis, a not infrequent occurrence in lobar pneumonia, appearing generally during the day preceding the crisis. Thus you notice that the temperature varied from 100.6° to 102.2° until November 2, at 6 P.M., when it again began to fall rapidly, so that at 9 P.M. it reached 98.6°, and at 3 A.M., November 3, 98°. Now consult the record, and you will note that within the nine hours respiration changed from 36 to 24, and the pulse-rate from 120 to 96 per minute. The actual crisis had taken place. Following the curve to 9 A.M. to-day, November 5, you find that the fever has assumed a remittent type with a general downward tendency.

If you have grasped and assimilated the points put forth in the discussion of the three cases presented to-day, you will frequently have occasion to demonstrate their practical value.

THE DIFFERENTIATION OF HEART-MURMURS.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL COLLEGE OF MEDICINE.

BY FRANK C. WILSON, M.D.,

Professor of Diseases of the Chest and Physical Diagnosis in the Hospital College of
Medicine; Fellow of the Louisville Medico-Chirurgical Society
etc., Louisville, Ky.

GENTLEMEN,—The differentiation of the various heart-murmurs is a matter of great importance to the clinician who makes the examination as well as the physician who prescribes. We are often called to see patients who complain of an affection of the heart. Perhaps we may be aware that our patient has trouble of such a nature, or patients may consult us who have organic heart-disease of which we have had no previous knowledge, and we should be able to detect and classify them. It is, therefore, of the utmost importance that the physician have a clear conception as to the exact condition of the heart, so that he may intelligently prescribe. In no other department of medicine is there more empiricism practised than in the management and treatment of so-called heart-disease. It is too often the case that it is simply a conclusion jumped at because the patient makes some complaint of palpitation or irregular action of the heart, and the physician prescribes the routine treatment,—digitalis, iron, strychnine, etc.,—without any idea of what may be accomplished, or what ought to be attempted in the management and treatment of this class of cases.

The physician ought first to have a fair understanding as to the exact condition of the heart; then he ought to bear in mind what must be the results of such a condition, or what the effect of the probable organic changes may be; then he should have a fair conception of what may be accomplished by the administration of certain remedies,—i.e., what effect their administration will have upon the condition of the heart. Having ascertained what effect will be produced by the administration of the different remedies singly, it may seem advisable to combine them in order to combat certain conditions brought about by the existence of organic changes of the heart, and the physician is then

in a position to prescribe intelligently. But too often, as I have said, the physician simply places his ear to the chest, discovers a heart-murmur, and jumps at the conclusion without even forming an idea as to what valve may be involved, or what the condition of that valve is,—he simply hears a murmur and concludes that the patient has heart-disease, and prescribes digitalis therefor, or iron, when digitalis may be contraindicated. Of course, digitalis is the remedy that is most frequently needed in the vast majority of these cases, but there may be instances in which it will not meet the indications, and the physician, therefore, ought always to be able to form his own definite idea as to the exact condition of the case in order to know what remedy should be employed.

We know that organic changes are mostly inflammatory in character, involving the lining membrane of the heart. What we mean by an organic heart affection is the change that is produced by inflammation, which involves the lining membrane of the heart, resulting in an exudate, inflammatory in its character, which as it becomes organized contracts. This inflammatory material or exudation infiltrates the entire depth and thickness of the serous membrane. This serous membrane, lining as it does the whole inside of the cavities of the heart, is reflected over the valves, and when this membrane becomes infiltrated with inflammatory exudate, which in its natural process of organization contracts, naturally it alters the size and shape of these membranous curtains,—they become twisted or warped, do not fit properly, and allow regurgitation. In another sense we have this inflammatory material, this inflamed tissue, dipping into and surrounding the orifices of the heart, which are closed by these membranous curtains. The exudate material may be so abundant as to be piled up, as it were, around the orifices in the form of excrescences or papular growths pressing upon these orifices to such an extent as to produce obstruction to the flow of the blood-current, although that flow may be in its normal direction. Therefore, you will see that at each one of these orifices we may have two conditions existing, either a twisting of the valve-curtains themselves, permitting regurgitation and a backward flow of the current, or we may have actual obstruction by a contraction of the orifices by the inflammatory action, or obstruction due to the filling up by the exudate material in the form of excrescences immediately around the orifices. We may have, therefore, a regurgitation or insufficiency of the valves, or we may have obstruction of the orifices. This may occur at each one of these orifices of the heart, and we have, therefore, two conditions at each one of the four valves of the heart.

As I have shown you, we have four valves in the heart, and we may have eight conditions existing which will produce murmurs in connection with the heart's action. In order to differentiate these, one must be careful to discover which one of these eight murmurs is present. There are certain data which we must ascertain in our examination of the case, and to do this we must study every point in order to ascertain the exact condition. In order to appreciate these data, of course, we must have a clear understanding of the normal action of the heart. The heart in its contraction after it is filled expels the contents from the ventricles out into the aorta on the left side, and into the pulmonary artery, on the other hand, from the right side of the heart. The action of these two sides of the heart occurs exactly at the same time. Of course, at the time of contraction of the left and right ventricles, we have closure of the mitral and tricuspid valves, preventing the blood passing backward into the auricles from which it has just been received by the ventricles. These valves close just at the time the ventricles contract. So we can see, if there is any insufficiency of these valves, we have a regurgitation caused by the improper closure of either one of these valves. A murmur would be produced by such regurgitation, the blood being forced backward through the valve just at the time when the heart contracts. This is an important point to remember: that a murmur produced by that condition—exudation causing a bad-fitting valve—would occur just at that time. Let us see if there is any other murmur which might be confounded with this. At the same time the heart contracts the blood passes on its onward flow in the normal direction, from the left and right ventricle out into the aorta, on the one hand, and into the pulmonary artery on the other, the backward flow takes place through the badly-fitting mitral valve or through the badly-fitting tricuspid valve. As I have indicated, at the same time this regurgitation occurs because of badly-fitting valves, we have part of the blood-current going onward in the normal direction, through the aortic orifice and through the pulmonary orifice. If there exists obstruction, if there is a narrowing of either one of these orifices, then the current of blood would produce a sound which would be heard synchronously with the heart's beat. So you will see there are four distinct and separate murmurs which may occur exactly at the same time, as far as the action of the heart is concerned. Of course, in our differentiation we must learn how to tell one from the other.

First. The regurgitant murmur, caused by insufficiency of the mitral valve. This would occur at the time the heart contracts.

Second. There may be tricuspid insufficiency, giving us a tricuspid, regurgitant murmur, which occurs exactly at the time the ventricle contracts.

Third. There may be obstruction at the aortic orifice to the onward flow of blood, interfering with the current from the ventricle out into the aorta, giving rise to a murmur, which would occur just exactly at the time that the heart contracts, the same as the other two murmurs mentioned.

Fourth. If there is an obstruction at the pulmonary orifice to the flow of blood out into the pulmonary artery, it would give rise to a murmur which would occur exactly at the same time as the other three referred to.

Now, let us see if we can tell which one of these murmurs is present in a given case. When you put your ear down upon the chest the point you must notice is the time when the murmur occurs. It is not sufficient to say that we hear a murmur. We must observe whether it is a loud bruit or blowing murmur, and just when it occurs,—that is, at what time with reference to the heart's action,—so that we may know what the heart is doing at that time, whether contracting or dilating. If we know whether the heart is dilating or contracting at the time the murmur occurs, we can reason out where this murmur is produced. When we ascertain, by putting the finger upon the radial artery, and by listening with our ear upon the chest, that the murmur occurs at the instant the pulse-beat is felt at the wrist, then we know that it is made at the time the heart is contracting, for we know that the pulse-beat corresponds with almost absolute accuracy to the contraction of the heart. Of course, as the heart contracts, the blood passes out through the aortic orifice, thence down through the axillary, brachial, and radial arteries until it is felt at the wrist. It is the wave or impulse only which is carried to the wrist, but practically we may consider it identical as to time. If we feel this pulse-beat at the wrist, and hear a sound at the same time with our ear upon the chest, we know that sound is made at the time that the heart is contracting. Therefore, it must be either one of the four murmurs I have mentioned which occurs,—either the mitral regurgitant, tricuspid regurgitant, aortic obstructive, or pulmonary obstructive.

The next question to be considered is, How are we to tell one from the other? While these four orifices are very close together, so that you would naturally suppose any murmurs, or any conditions which existed there producing murmurs, would cause the sounds to be so confusing or so close together that you would not be able to separate one

from the other, nature fortunately conveys these sounds in different directions so as to reach the surface of the chest. So that when you hear these sounds communicated from the four valves, although the valves in which the sounds originate may be close together, yet when the sounds reach the surface of the chest they are widely separated from each other; they diverge from each other, so that the points at which you can hear them on the surface of the chest with the greatest distinctness are very much more widely separated than are the orifices where the sounds are produced. That is brought about in this way: take, for instance, the mitral valve; sounds produced at the mitral valve are conveyed by and take the course of the chordæ tendinæ, which have their attachment down near the apex of the heart. These sounds are conducted with greater distinctness along this course than in any other direction. Therefore, put your ear right over the apex of the heart and you will hear these sounds, just as you would hear a sound at one end of a long string if the ear were placed at the other end. Take a string one hundred yards long with a sounding-box at one end and a simple sounding-board at the other end. You may scratch your fingernail on the sounder at the far end of the string and at the other end it may be heard very distinctly. On the same principle, these little tendinous cords which are attached to the mitral valve act as conductors of sound, and they convey that sound down near the apex of the heart very much more distinctly than in any other direction; much more distinctly than sounds passing directly through the tissues at a closer distance, immediately over the valve; so that, as I have said, the point down near the apex of the heart is the point of greatest intensity,—the mitral area, as it is sometimes called.

In the same manner we have a corresponding area near the ensiform cartilage, where the tendinous cords which are attached to the tricuspid valve reach the apex of the heart; so that the sounds produced by the tricuspid valve are heard more distinctly in that area than they could be heard immediately over the tricuspid valve.

Now, you see, these two areas are widely separated from each other, although the valves themselves are not more than one inch apart. Therefore, you can see when you put your ear down upon the surface of the chest, if you hear a sound more distinctly in the mitral area than anywhere else, the natural inference is that that sound is produced at the mitral valve. If the sound is produced at the time the heart is contracting, you know it must be a mitral regurgitant murmur. If you hear the sound more distinctly at the ensiform cartilage, and not over the apex of the heart, then you know the sound is produced

by the tricuspid valve. Thus we may have a tricuspid regurgitant murmur.

In case of the aortic orifice: Sounds produced at this orifice are conveyed by the blood-current that is going in the normal direction. The current of blood passing through the aortic orifice goes thence out into the arch of the aorta over towards the right edge of the sternum. The current carries the sound with it; therefore, any murmur would be heard more distinctly right at the edge of the sternum than immediately over the aortic valve. We, therefore, conclude, whenever we hear a murmur more distinctly at the right edge of the sternum than anywhere else on the chest, if this murmur is heard best with the systole of the heart, that the sound is made at the aortic orifice. As the sound is produced at the time the heart is contracting, of course it must be made by the blood-current passing through an obstructed aortic orifice.

If a sound is heard more distinctly at the left edge of the sternum: While the pulmonary orifice is on the right side, a little to the right of the middle of the sternum, yet this artery passes to the left, and, of course, conveys the sound towards the left, which may be heard at the left edge of the sternum more distinctly than anywhere else. Therefore, if we hear a murmur at the left edge of the sternum, the natural inference is that the sound is produced at the pulmonary orifice, that the murmur has been produced by an obstruction at the pulmonary orifice, and is conveyed by the current in that direction. From this you will see that we have all the data we need to differentiate the four murmurs under consideration. There are certain other data that we can also make use of in order to confirm or correct a diagnosis that we may have made. These consist in tracing the sounds in certain directions. We can understand how these sounds may be traced when we consider that they are carried by the means I have already indicated.

Take, for instance, the sound produced at the mitral orifice. Mitral regurgitation is produced by an insufficiency of the mitral valve, and a sound occurs which is due to the backward flow of blood,—that is, from the ventricle back into the auricle, and the blood carries with it the sound. If we follow the current in that direction with the ear, we will be able to trace the murmur for a considerable distance. As you put your ear at the apex of the heart, the sound is heard there with the greatest distinctness,—in the mitral area or area of mitral intensity, as it is called. Then slide the ear up towards the axilla and you get exactly in the direction the blood-current is going, and, of course, that is the direction in which the sound is being carried by

the current. Following the current from the apex up towards the axilla, if we can trace the sound in that direction, it becomes confirmatory evidence of the correctness of the conclusion at which we have arrived from the data already given. We can trace the sound still farther. As the current passes from the ventricle back into the auricle, of course it passes up into the auricle until it impinges against the posterior wall of the auricle which rests against and along-side of the vertebral column; and if you can pass around to the back and place your ear right opposite this point, you may be able to detect the sound even that far. As the current impinges against the posterior wall of the auricle the sound is carried through the solid tissue, and if you place your ear along-side the vertebral column, between the fifth and eighth dorsal vertebræ, the sound may be traced in that direction. This would also be confirmatory evidence of the conclusion already indicated.

In case of tricuspid regurgitation: The sound is heard more distinctly down over the ensiform cartilage, the tricuspid area, or the area of tricuspid intensity. The direction of the current is upward and backward, exactly as it is in case of the mitral current. If you place your ear over the tricuspid area and pass it upward and to the right, you will be able to follow the current, and probably be able to trace the sound in that direction. But the difficulty of hearing the sound is much greater in cases of tricuspid regurgitation than obtains in mitral regurgitation. In cases of mitral regurgitation you have the auricle pressing against the back, but in tricuspid regurgitation you have the right auricle placed in front of the vertebræ, and you have the whole thickness of the spine between any point where you place the ear posteriorly and the point of production, and you are not likely to hear a tricuspid, regurgitant murmur over the back. So we must be satisfied in our confirmatory evidence of tricuspid regurgitation when we find that we are able to trace the sound upward and to the right.

In cases of aortic obstruction the murmur is heard more distinctly at the right edge of the sternum, and then, of course, we can follow it still farther as it is carried by the current up into the arch of the aorta and into the neck. The current of blood will carry this sound to a great distance, and after detecting it more distinctly at the right edge of the sternum than anywhere else, we follow the arch of the aorta, then along the side of the neck, to see if the sound can be traced to these points. If so, it is evident that the current of blood has conveyed the sound to that great distance, and this becomes confirmatory evidence of the conclusions previously arrived at.

In cases where the trouble is in the pulmonary orifice the sound made by contraction or obstruction is heard more distinctly at the left edge of the sternum, but we can trace it in the direction taken by the pulmonary artery,—that is to the left and upward towards the left shoulder. Of course, the pulmonary artery soon becomes buried deep beneath the tissues surrounding it, and the sound cannot be traced for any great distance; but we can trace it in the direction of the left shoulder just in the course that we know the pulmonary artery takes.

We have taken up to-day the aortic and pulmonary obstructive murmurs, and the mitral and tricuspid, regurgitant murmurs, because these four occur exactly at the same time. They occur exactly at the time the heart contracts, and I have simply tried to show you how to differentiate one from the other. That will naturally be the first question to arise in your efforts to make a diagnosis. In examining a case, if you find there is a heart-murmur, the first point you must ascertain is when the sound is produced; second, where it is heard most distinctly; third, the direction in which the sound can be traced. Now, you can fix these points in your mind by simply recollecting three words, "WHEN, WHERE, and WHITHER." Those three words will fix distinctly in your minds what you must do. Ascertain when you hear the sound with reference to the heart's action; then where you hear it most distinctly,—that is, in what particular area; then the direction in which it can be traced.

Let us consider now how these rules can be applied to the differentiation of the remaining four murmurs,—viz., aortic regurgitant, pulmonary regurgitant, mitral obstructive, and tricuspid obstructive.

In the aortic regurgitant and pulmonary regurgitant they would be heard as the semilunar valves are in the act of closing and the heart dilates; or, in other words, with the second sound. Each will be heard most distinctly in the area of greatest intensity appropriate to the respective valve; the aortic at the right edge of the sternum, and the pulmonary at the left edge. The sounds will both be traced downward towards the ensiform cartilage.

The mitral and tricuspid, obstructive murmurs are the most difficult to detect, and are, therefore, most frequently overlooked. Some observers even go so far as to assert that they never occur. I am sure that I have detected upon post-mortem examination pathological conditions at the mitral orifice which could not possibly have failed to give rise to an obstructive murmur which had not been detected ante mortem. For the production of an audible sound by the current of blood passing from the auricle above through the obstructed mitral orifice to

the ventricle below, there are certain essential conditions that must be fulfilled. First, there must be sufficient obstruction, and, second, the force and rapidity of the current must be great enough to produce the vibrations. These conditions are fulfilled only near the close of the period of dilatation, just as the auricle by its contraction forces its contents down through the orifice into the ventricle, which immediately contracts, and any sound produced is at once cut short by the closure of the mitral valve, or merged into the regurgitant murmur, if the valve is incompetent. This same reasoning will apply with equal force to the tricuspid orifice.

Neurology.

THE SIGNS TO OBSERVE IN BRAIN DISORDER IN CHILDREN.

CLINICAL LECTURE DELIVERED AT THE LONDON HOSPITAL.

BY FRANCIS WARNER, M.D. (Lond.), F.R.C.P.,

Physician to and Lecturer on Clinical Medicine and Therapeutics in the London Hospital, England.

GENTLEMEN,—Among the out-patients you frequently have presented to you children, from infancy upward, with the complaint that one hand is not used, or is always kept closed; that it is backward, or does not walk or talk, or that convulsions have occurred. In other words, you are frequently called upon to make a clinical examination of a young infant or child as to its brain condition, or brain disorder, congenital or acquired. You should then be prepared to make a systematic clinical examination, recording the physical signs of the brain state as accurately as those of the heart or lungs; such an examination should be conducted upon fixed principles.

The chief signs upon which we depend as evidence of brain status are motor, and it is by observation of the movements and actions that the most accurate information is obtained.

The infant brain in action—i.e., when not asleep—is characterized by constant spontaneous movements, and their absence is a sign of debility or deficiency. At the age of four or five months such movements as seen in the digits may be inhibited momentarily; later they are co-ordinated by sight and by sound, as when the infant takes hold of an object seen or turns its head towards the source of a sound. These points are characteristic of a healthy infant brain and are physical signs of a sound and healthy condition. You must first practise observation of the physiological condition of the brain, that you may readily recognize pathological deviations therefrom.

Speaking generally, we may say that the child learns to walk and talk during its second year: by seven years of age the brain reacts well through the senses; movement is well co-ordinated and indications of mental power become manifest. Let us look at such a child

and make a systematic examination of its brain condition, looking for the normal physical signs and observe any deviations therefrom, proceeding in an orderly manner as in the examination of other organs.

Commencing with the *motor cranial nerves*, we note movements of the eyes, which are affected by the third, fourth, and sixth nerves; as the child stands before you tell him to look at and follow your finger as it moves; observe the eye-movements in each direction, vertically and laterally. In cases of brain-disease—*e.g.*, meningitis—the word of command may produce no reactions; we must wait, therefore, and watch for spontaneous movements to occur which are not produced by any stimulus from without. Ptosis must be specially mentioned as a symptom. Drooping of the eyelid on one or both sides from weakness of its levator muscle is an indication of weakness of that branch of the third nerve; as a symptom suddenly occurring, whether partial or complete, ptosis is very suggestive of brain-tumor, meningitis, syphilis, etc. It is, however, a not uncommon congenital condition, usually present on both sides. I shall have to refer to spontaneous movements of the eyes and reactions of the pupil later on.

The fifth cranial nerve sends motor branches to the muscles of mastication: if the teeth are kept in contact by the action of the masseter and temporal muscles while the pterygoids are in action, tooth-grinding results, and the teeth become worn so much that their points are ground down and flattened as if they had been filed. The sensory divisions of the fifth nerve are widely distributed over the head and face; branches are also distributed inside to the meninges. Tooth-grinding and ground teeth indicating such occurrence in the past during sleep are signs of brain irritability; probably the brain has not been in a condition of quiescence during the hours of the night. Ulceration of the cornea with anæsthesia and iritis with suppuration may indicate disease at the root of the fifth nerve; such may occur in the facial herpes zoster or in pressure from a tumor.

The facial nerve is often paralyzed in childhood; usually due either to ear-disease or to a temporary neuritis from cold or possibly from rheumatism. Carefully observe the face in action; it is very necessary to distinguish between disease of the portio dura nerve and paresis due to disease of the brain centres. Tell the patient to show his teeth; to close each eye separately, then the two together; to draw the eyebrows together (corrugation); to raise the eyebrows (bringing into play the occipito-frontalis muscle), then note and compare the degree of movement resulting on either side. In the performance of such movements there may be seen various kinds of action-paresis or lessened

movement; spasm, as in stammerers; twitches, as in chorea; or athetoid movement, as is common in brain deficiency, which is mostly seen in the muscles of the forehead. Watch the face for a while quietly to see if any such movements occur spontaneously. The movements of the palate should also be observed. The hypoglossal nerve may be studied by observing the tongue when protruded, as to its straight direction, lateral deviation, tremor, or jerky movements.

Pneumogastric and Spinal Accessory Nerves.—Note the rhythm of the pulse and respiration. Intermittence of the pulse is an early sign in meningitis; laryngismus stridulus, asthma, cerebral vomiting, diarrhoea without digestive disorder, and other pathological conditions may be present in disease. There may also be spasm and twitching of the sterno-mastoid muscles. I cannot, however, dwell on these points now.

Having observed groups of muscles supplied by the cranial nerves, as seen in action, we proceed in our clinical examination to describe *groups and series of movements as produced by the brain centres*. Again looking at the eye-movements, note if the eyeballs and upper lids move harmoniously in the vertical direction. There may be conjugate deviation of the eyes to one side without squint, the eyes being fixed in that direction and turned towards the side of the lesion in hemiplegia, or turned from it in hemispasm. In the deep sleep of infants, in coma, and in deep anaesthesia the eyes make each movement separately, indicating paralysis of their co-ordinating centres. Nystagmus, or vibratory oscillation of the eyes, is usually lateral, it may be vertical or rotatory. Convergence of the eyes on an object twelve inches from the face may indicate hypermetropia, and is not a sign of brain disturbance.

Reactions of the pupil are very interesting and important signs. Paralysis of the third cranial nerve, or irritation of the sympathetic, causes dilatation of the pupil. Test each eye separately as to the reactions to light, and also as to contraction on accommodation for near vision. Further information may be obtained as follows: shield one eye from the light with your hand, leaving the other eye sufficiently exposed for observation, and let an assistant flash light on the exposed eye, noting its reaction upon the eye shielded. In this reaction a stimulus from the retina receiving an impression from the light passes by the optic nerve and tract to the corpora quadrigemina, there producing an efferent current passing by the third cranial nerve to the iris of the eye observed. The other eye should be similarly tested; this reaction of light through the brain may be traced in idiots in whom no indications of perception can be obtained by their replies or actions.

It is not sufficient to examine the different cranial nerves and brain centres, we need to examine *brain areas or groups of brain centres*, and may now conveniently proceed to the systematic examination of certain co-ordinated movements in the face and the upper extremity. Facial movements are in normal conditions symmetrical : especially note any action about the angles of the mouth, as in showing the teeth or in the finer action of quiet smiling ; there may be paresis, spasm, or athetoid movement with grinning. Look at the motor area commonly affected in hemiplegia : let the patient pick up a pin off a plane surface with either hand alternately, or unfasten and refasten the middle button of his waistcoat. Let the child hold out his hands with the fingers open and while looking at your hands imitate your movements. Damage to the brain area corresponding may be indicated by the slowness and inaccuracy of finger movements on one side. In the young infant spontaneous movements of the fingers must be observed : on the side corresponding to a damaged brain area there will be less separate movement of the digits, though all may open and close together. In an aphasic patient, who could write with his right hand, I was able to detect want of due co-ordination of the fingers of that hand in movements imitated well on the left side. Accurate imitation of the separate movements of the fingers is a good test of the co-ordinating power of the brain. Such modes of examination I think very important ; they were followed as to their clinical uses in my former clinical lecture.¹

Having spoken of the parts where we may look for the signs of brain condition, a few words must be said as to the modes of abnormal action that may be present. There may be

(1) An *excess of spontaneous action* and incoördinated movements,—many uncontrolled movements of small parts with variations. Such are characteristic of chorea.

(2) *Cerebral reinforcement* : an irregular spreading area of movements in excess on any stimulation,—*e.g.*, when the child is spoken to, in place of reply we may see the shoulders shrugged, the tongue protruded, the eyes much moved, and the fingers twitching,—the series varying on different occasions. Such is to be seen in chorea and in nervous children.

(3) *Incoördination without spontaneous movements*. During rest there may be no spontaneous movement, but on any exertion much extra movement may occur. While this condition is characteristic of

¹ INTERNATIONAL CLINICS, vol. ii., 1895.

disseminated sclerosis, similar signs may be seen in some functional states and in nervous children.

(4) *Athetosis*. Uniform repeated movement, occurring apparently spontaneously or on any stimulus received, but not controlled and adapted by the senses, and therefore useless. Such may be observed in earliest infancy, and may be seen in the hand or face on observation, as previously described: it is usually accompanied by hypertonicity and occurs with paralysis or epilepsy.

(5) *Absence of spontaneity,—statuesque children*. The child may stand motionless, without facial expression. This is common in cerebral deficiency, all movements being slow and co-ordination imperfect, the mental expression being equally inert.

(6) *Hypertonicity*. The limbs may be rigid in varying degree, resisting passive movements; such is common in the hemiplegia of children. The wrist-movements may be stiff, and it may be found impossible to obtain a free swing at the knee as the child sits on a table with the leg hanging free. Hypertonicity is often found in all the muscles with weakness in cases of cerebral deficiency.

Collateral evidence of brain disorder may be obtained in many other ways. *Ophthalmoscopic examination* may show a physiological condition, optic atrophy, neuritis, defect or disease of the retina or choroid, and may indicate tubercle, syphilis, or congenital defects of the eye. The sight should be tested and errors of refraction corrected. The ears should also be examined, as well as the throat and nasal passages. Heart defect is common with congenital cerebral deficiency, and valvular disease is often accompanied by headaches and chorea or neurosis. Variability of the frequency of the pulse and irregularity of rhythm may be important indications.

Cutaneous sensibility should be tested: the difficulty with children is that in many cases, especially with brain deficiency or disease, the replies of the patient, upon which we largely depend in such examination, are vague and untrustworthy. Children with some degree of mental deficiency are often very anæsthetic, and pass under dental operations apparently almost without pain.

Speech and Signs of Intelligence.—All expression of mental action is by movement, and speech is the most important indication of mental power. Thickness of utterance may be due to nasal defect. Words may be badly spaced; the voice may be monotonous and badly intoned as the result of deficient training. Stammering presents visible muscular spasm in the face, which usually commences about the mouth, often on one side, the area of spasm on commencing to articulate,

spreading to the depressors of the lower jaw and of the hyoid bone and to the tongue. Other muscles of the face may be thrown into spasm in succession. The teacher should learn to observe such commencing spasm and stop the effort of speech when it is seen.

In applying mental tests allowance must be made for the child's age and previous instruction as well as for its opportunities of acquiring general knowledge and experience. Still it is as well to make some systematic mental examination. Let the child read, standing so that you can see its eyes, noting whether they follow the words regularly and with accuracy. The child may count the contents of your purse, sorting the coins and adding their value; then let it write down the value of each class of coin and add the sum; each method will tell you something. Similarly he may count other objects and add figures by mental arithmetic; accuracy in telling the time by the clock is another test. Take a sample of its writing, and see if it can draw at all. It may be asked to measure the table with a tape or to estimate the size of the room by its eye. Muscular sense may be tested by the patient's estimate of coins in the open hand, and touch by accuracy in the recognition of their size with the eyes closed. Let the child tell you about a walk out of doors or its amusements, that you may note conditions of speech and gain information as to its general knowledge.

I have endeavored to place before you an account of the physical signs that may be used in the clinical study of the brain conditions of infants and children, and have purposely omitted reference to many points more readily adapted to adult patients and commonly used in medicine, as well as many signs found in pathological conditions. Many of the signs described are applicable to the examination of infants and very young children in whom the absence of speech and the slight power on control through the senses otherwise limits our means of clinical description. If you learn to observe accurately the spontaneous movements of healthy infancy, you will find it quite possible to note many of the signs described in infant brains the subject of disease or congenital defect. In this employment of the signs, I would especially direct your attention to the remarks made on eye-movements, athetosis, hypertonicity, and the comparison of movements on the two sides of the body as to symmetry.

Many additional signs for clinical observation are defined in the catalogue of the "Report on Mental Conditions of Childhood," recently published by a special committee.¹

¹ Parkes Museum, Margaret Street, London W., 1895.

ARTHROPATHIES AND TROPHIC LESIONS IN LOCOMOTOR ATAXIA.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY JAMES HENDRIE LLOYD, A.M., M.D.,

Physician to the Nervous Department of the Philadelphia Hospital, to the
Methodist Episcopal Hospital, and to the Home for Crippled
Children; Consulting Neurologist to the Elwyn
Institute for Feeble-Minded Children.

LADIES AND GENTLEMEN,—It is not my intention to lecture to you to-day on locomotor ataxia, but only on one comparatively limited phase of that great subject. I intend to confine myself to a description of some of the trophic lesions of tabes. I must take it for granted that you already know something about locomotor ataxia, especially its clinical features, and therefore that you will be able to follow me in the demonstration which I am about to give of the affections of the joints which sometimes complicate this interesting disease. My reasons for limiting the subject are twofold: first, because I have not time in one lecture to give a complete pathological and clinical description of tabes; and, second, because I want to make a strong impression on your minds by concentrating your attention upon a special feature of the disease, a feature which has, as it were, a striking individuality.

A spinal arthropathy may be defined as a trophic lesion of a joint due to disease of the spinal cord. Locomotor ataxia is not the only disease of the spinal cord that causes arthropathies; they are caused also by syringomyelia, and they are found, very rarely, in general paresis. In the latter instance they doubtless depend upon degeneration in the cord, coincident with or secondary to the cerebral disease. There is no reason to believe that arthropathies, at least of the kind here referred to, are ever caused by purely cerebral lesions. In one rare instance, which I shall illustrate to you to-day, I have seen arthrop-

athies of the knees in apparently simple progressive muscular atrophy. But the disease which, more than any other, causes this destructive process in the joints is locomotor ataxia.

The recognition of arthropathies of spinal origin is of importance both to the physician and to the surgeon. In these cases it is necessary for these practitioners to be neurologists if they are to avoid mistakes in diagnosis and errors in treatment. I have known several of these errors. In two instances, now, I have known surgeons to operate on these joints without recognizing their exact nature, mistaking them for purely surgical affections. In one of these instances, to be sure, the patient was distinctly benefited, so I suppose that the surgeon would say that he had done his whole duty. Still, I think it is best, as a rule, for surgeons to know the true pathology of an affection upon which they operate. In another case I knew of a physician making a diagnosis of rheumatism in a case of spinal arthropathy and treating it as such. It is very probable, in fact, that before the recognition of the true nature of this affection by Charcot, now within comparatively recent years, these joints were constantly mistaken either for surgical or rheumatic joints. I mention these facts to you so as to make plain the way for you to avoid similar not unnatural errors; and the bulk of my lecture will be devoted to a clinical demonstration of the affection itself so as to enable you to recognize it.

First, let me make a point as to the relation of the joint-disease to the cord-disease. The pathogenic relationship is still somewhat obscure. It is that of a trophic lesion, just as muscular atrophy, brittle nails, blebs resembling pemphigus, shining skin, etc., are trophic lesions caused by diseases of the cord and nerves. In locomotor ataxia, according to some observers, these arthropathies are more common in what is called the *sensory* type of tabes,—i.e., those cases in which fulgurant pains are early and distinguishing features. Some cases preserve this type for years before ataxia develops. They are the cases, too, in which atrophy of the optic nerve is rather more common. The *motor* type—cases in which ataxia is an early and distinguishing symptom—are not so likely, according to this view, to present arthropathies. The most common type of tabes, however, is that in which both sensory and motor symptoms are observed. In these cases, when arthropathies occur, they may be due possibly to involvement of the sensory structures in the cord, as indicated by fulgurant pains; but this is rather a speculative question as yet, and need not detain us here further than to permit me to emphasize to your minds the fact that these joint-changes may occur occasionally in cases of tabes in

which ataxia is not conspicuous,—in other words, in the preataxic stage. Now, as ataxia is the symptom upon which the general practitioner is most likely to rely for a diagnosis of tabes, you see it is important to recognize the facts just stated, because in such a purely sensory type of case with arthropathy the physician might imagine, unless he were alert, that he did not have a case either of spinal arthropathy or even of locomotor ataxia. In confirmation of these views, Dr. Putnam, of Boston, has recently called attention to the hyperflexibility of the thigh in this disease. According to him the thigh in tabes can often be flexed without bending the knee until the leg almost touches the ear. This hypermobility of the hip-joint, without pain and tension in the knee-joint, which, according to Putnam, is more often seen in the sensory than in the motor type of cases, is probably due to slight beginning trophic changes in these joints.

As to the relationship in time, it may be said that the joint-changes do not occur, as a rule, early in the course of locomotor ataxia,—in other words, they are not precocious. They usually occur after the primary disease has declared itself so fully as to admit of no doubt of the diagnosis. This fact is, of course, immensely in aid of the diagnosis of the affection of the joint, so that in most cases it seems incredible that there should be any oversight or mistake. Occasional cases occur, however, as already said, in which the arthropathy is a comparatively early symptom. In such cases a careful search for other tabetic symptoms may alone succeed in revealing them, and in clearing up the diagnosis. In such an early doubtful case the history of fulgurant pains would be of great significance, and commencing optic atrophy would practically confirm the diagnosis.

Tabetic arthropathy is sometimes abrupt or sudden in onset. It may even come during one night and rather surprise the patient in the morning, because he has felt no premonition of what, to him, is naturally a rather astonishing phenomenon. I recall one case in a woman in this hospital in whom quite extensive arthropathies of the knees were discovered rather accidentally by the resident physician and myself. We had been accustomed to see the patient sitting in her chair in the ward, and having made a diagnosis of tabes in her case had not studied her condition critically for quite a long period. On her part she had felt no discomfort or inconvenience from the strange swelling of her knee-joints, which had come on so painlessly that she hardly knew the exact time, and so she did not call our attention to it. The illustrations (Figs. 1 and 2) are from her case, and show quite typical

arthropathies. The patient unfortunately is no longer in this hospital. This abrupt onset is not the absolute rule, however. In some cases the approach is more gradual, and may be preceded by an immense œdema involving the whole leg. This œdema gives the leg almost the appearance of elephantiasis. The limb is hard and brawny and does not pit readily, if at all, on pressure. As the œdema subsides it leaves the joint swollen; and then in a short time the articulation is seen to be undergoing the changes that characterize arthropathy.

Deformity is the most striking characteristic of spinal arthropathy.

FIG. 1.

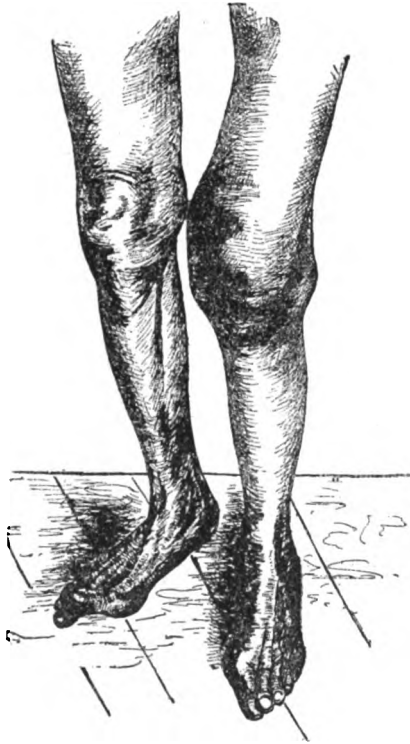


Tabetic arthropathy of knee-joints.

The brawny swelling of the limb, just referred to, tends to subside, and as it does so the particular joint involved is seen to be distended. This enlargement of the joint is sometimes enormous. Referring again to the photographs (Figs. 1 and 2) it is seen that in this case the left knee-joint is the more involved. The distention is evidently caused by an accumulation of fluid within the synovial sac. This fluid extends far up in front of the lower end of the femur under the tendon of the quadriceps extensor. Fluctuation may usually be detected.

As time advances the deformity of the joint is augmented by a preternatural mobility. This is sometimes quite extraordinary; it is always the cause of peculiar appearances. The photographs show characteristic deformities of the knee-joints. The left knee-joint, you observe, in one attitude is unnaturally abducted,—i.e., bent outward away from its fellow. In such cases the other joint is usually just as unnaturally adducted,—i.e., bent inward towards its fellow.

FIG. 2.



Tabetic arthropathy of the knee-joints.

This gives the patient's legs the position of parallel bent sticks. In the case illustrated in the pictures the patient's right knee-joint has not yet assumed an abnormal position, because it is not yet so much involved as its fellow. In addition to this lateral deviation the knee-joints tend to bend backward to an abnormal extent. This can be seen only from the patient's lateral aspect. In the second photograph the patient is seen standing with the knees close together. This gives a rather better idea of the swelling of the left knee in contrast with the

right. In walking, however, this position would not be retained, but the leg would assume the position shown in the first photograph. This preternatural mobility causes strange and almost startling deformities in some other joints. A recent French author, Brissaud, gives an illustration of an arthropathy of the shoulder-joint in which it was possible to make such extreme supination or pronation as to rotate the hand entirely around until it assumed the same position that it holds normally,—in other words, to twist the arm completely around in either direction. The shoulder-joint, by the way, is sometimes swelled to an enormous extent as a spinal arthropathy; to a minor extent the elbow and ankle are also involved. The hip-joint is not so likely to be distended; it nevertheless undergoes great change in some of these cases, but rather of an atrophic type.

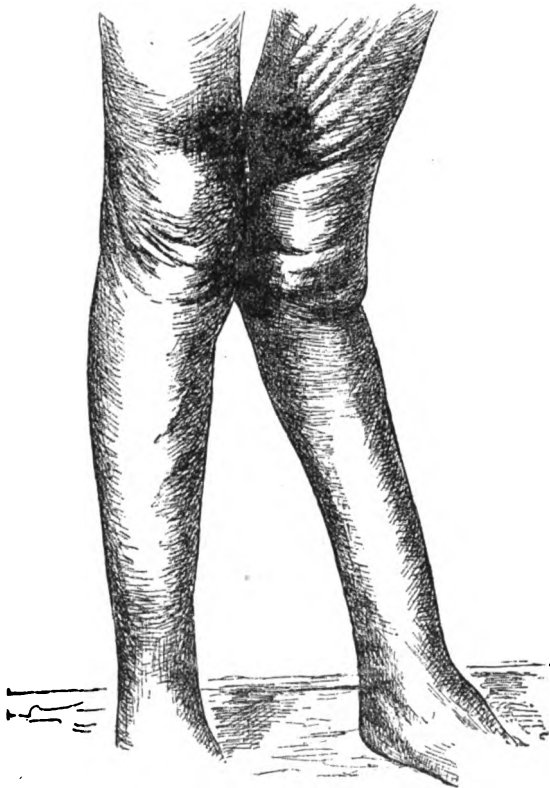
I now show you a patient whose case has one or two features of peculiar interest. In the first place the patient is a colored woman. A question was once raised in this city whether locomotor ataxia ever occurred in the Negro race. At the time I could not see any reason why it should not, and I had not long to wait for an answer in the Blockley wards. The patient's case will be reported in detail elsewhere by one of the resident physicians: I wish merely to present the woman in order to show you her arthropathies.

M. G., age forty-six, colored. She had some venereal disease, probably syphilis, in early life. She has a history of ataxia and fulgurant pains, coming on about the same time one year ago. If this history is accurate the involvement of the joints began early, for the patient first noticed it six months ago. However that may be, the condition of the knee-joints is as you see it. There is some, not great, effusion, and there is marked abnormal mobility. The leg can be over-extended at the knee-joint about 35 degrees beyond the axis of the femur. There is also marked lateral motion (which, you know, is almost entirely absent in the normal knee) and there is also a distinct grating sound on passive movement. When the patient stands, you observe especially the over-extension of the leg at the knee, causing the joints to bend backward, and in this case inward to an unnatural degree. (Fig. 3.) This over-extensibility is even better shown when the patient is lying on her back and the whole limb is lifted from the bed by some one taking hold of the foot. As I thus elevate the leg, you see that the knee-joint is extraordinarily relaxed and mobile, and permits the leg to bend forward at this joint far beyond what it would do in health. This is called retroflexion of the joint.

I present to you here a patient with an arthropathy of the ankle-

joint. (Fig. 4.) You observe that the joint is somewhat distended and the whole leg slightly swollen. This case is of recent origin in a man who is typically tabetic, with both fulgurant pains and ataxia, but the details of whose case I need not stop to give you. I wish to call your

FIG. 8.

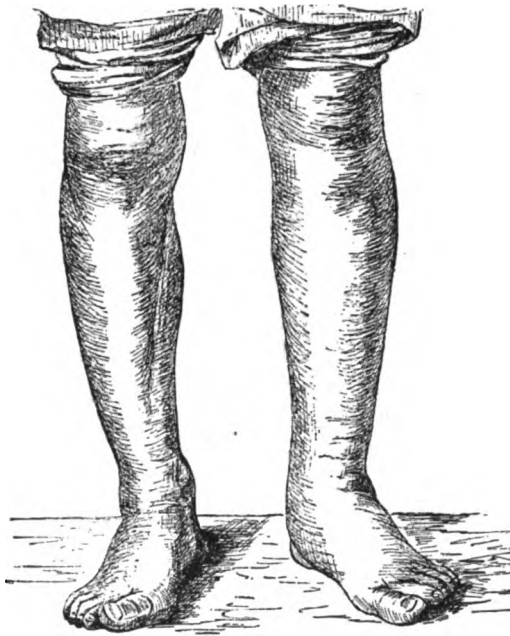


Retroflexion of the knee-joint in tabetic arthropathy.

attention chiefly to the fact that the affection of the ankle incommodes the patient very little. He complains of no pain in the joint, and is not aware that the swelling interferes in any way with his gait. I shall return to this aspect of the subject presently. The same statement may be made with reference to the affection in the knees. In spite of the extreme deformity, these patients are usually able to walk about much better than would be supposed. The joints bend laterally and backward with the weight of the body, giving the patients a rickety and unstable appearance, and yet these men and women often manage to get about with the assistance of heavy canes.

This preternatural mobility tends to produce dislocations. A partial dislocation, in fact, is not uncommon in arthropathies. In the knee-joints, for example, it is not unusual to observe that the head of the tibia tends to be dislocated backward; also that partial dislocations are possible. This tendency is, no doubt, due to the relaxation and degeneration that take place in the ligaments and capsules of the joints. Hence a dislocation in a joint in a person with tabes is always suggestive of arthropathy, even though positive indications, such as

FIG. 4.



Arthropathy of the left ankle-joint.

swelling and deformity, do not yet exist. The dislocation in itself is an indication. I have now under my care in this hospital a woman with locomotor ataxia of some years' duration. She has most severe gastric crises (which are akin to fulgurant pains), and she is now practically bedridden and approaching the terminal period of her disease. She has no apparent arthropathy, but she has twice dislocated her right shoulder-joint from some trifling accident as she was sitting up in bed. The last time this occurred I reduced the dislocation myself and took the opportunity to examine the articulation with more than usual care, but I could not determine any trophic changes or swellings; and yet I

have no doubt that the dislocation was favored by some beginning atrophic changes in the ligaments and other structures.

A very common symptom in spinal arthropathies is a grating sound produced by rubbing the opposing articular surfaces upon each other. It is often quite surprising how soon this manifests itself. It is caused by the denudation of the heads of the bones,—one of the commonest changes caused by the trophic process. These grating sounds or “craquements” are usually very loud and distinct.

There are some characteristics, of a *negative* kind, that are of great value in distinguishing spinal arthropathies. The most important of these is absence of pain in the affected joint. This is almost invariably the rule, and when an exception occurs to it the exception is more apparant than real. It must strike every one, when he first sees one of these enormously swollen and distorted joints, how remarkable it is that the patient suffers no pain either spontaneously or upon use and manipulation of the joint. In this respect the articulation is in marked contrast with a rheumatic or tuberculous joint. It is important, however, not to mistake the fulgurant pains of the central disease for pains caused by the joint affection. These are entirely independent in their origin of any disease in the joint. They are of central origin, and, as already said, they may precede the appearance of arthropathies for months and even years. Another negative symptom is absence of heat; another, still, is absence of redness,—in other words, there are no symptoms of inflammation in the joint. Pain, heat, redness—so characteristic of inflammatory processes—are all conspicuous by their absence.

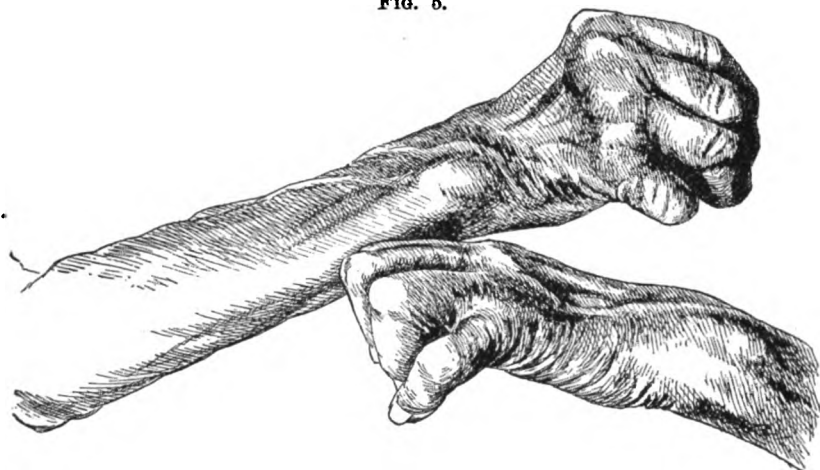
In this connection, however, it is proper to call attention to a few complications that may occur in these cases. A spinal arthropathy may become the seat of infection, and thus take on a truly inflammatory and purulent process. This may be caused by a wound, a bruise, or especially by an incision. Surgeons should recognize the possibility of such a secondary infection when they propose to open and drain such a joint. The trophic processes are low and vitiated in these joints; hence their resistive powers are below normal. When a true inflammation occurs in arthropathy the usual symptoms—pain, redness, heat, and swelling—are present; but, as said already, these do not constitute an exception to the rule,—they are merely evidences of a complication.

Fractures also are occasional complications of arthropathies. They depend upon a brittleness of the bones, caused by a trophic disturbance. They may be placed in the same category as luxations, although in my experience they are not nearly so common as luxations, as complications of tabetic joints.

As I said in the beginning, arthropathies are not confined to locomotor ataxia. It is possible that we may yet find that they occur in some diseases of the spinal cord, in rare instances, in which they have not yet been suspected. In confirmation of this view I want to exhibit to you a few photographs of a patient who has recently been under my care in another hospital. A brief summary of the case is as follows :

N. S., aged forty-six, married, has muscular atrophy of the shoulders, arms, and upper extremities. This atrophy is well shown in the forearms and hands (Fig. 5) in which the interossei are wasted. The hands have not quite assumed the position of *mains-en-griffe*, but they

FIG. 5.



Arthropathy of the wrists and phalangeal articulations associated with muscular atrophy of the forearms.

are approaching it. The left wrist is swollen and evidently the seat of trophic changes. The patient has marked scoliosis (Fig. 6) or lateral deviation of the spinal column,—a symptom seen in some diseases of the cord, especially syringomyelia. The knees were the seats of marked effusion, which, however, had been evacuated before the photograph (Fig. 7) was taken. Hence swelling is not marked in them in the photographs. It is interesting to observe that deformity and dislocations had not occurred in them; they are quite straight and normal in appearance, although formerly much swollen. The surgeon who aspirated the knee-joints reported that some pus apparently was present in the effusion in one of them. This may account for the fact that the joint had been and remained painful,—in other words, it may have been

the seat of a secondary infection, like that already spoken of. The patient had no ataxia or fulgurant pains indicative of tabes, nor any thermo-anæsthesia indicative of syringomyelia. There was rather more pain in the joints, both knees and wrists, than was to be expected in ordinary arthropathies. The case had some remote resemblance to arthritis deformans, and this raises the question, which cannot be discussed here, whether arthritis deformans may be a trophic disorder dependent upon some central lesion.

The morbid anatomy of spinal arthropathy may detain us for a moment. In an autopsy on one of my patients in this hospital, a few

FIG. 6.

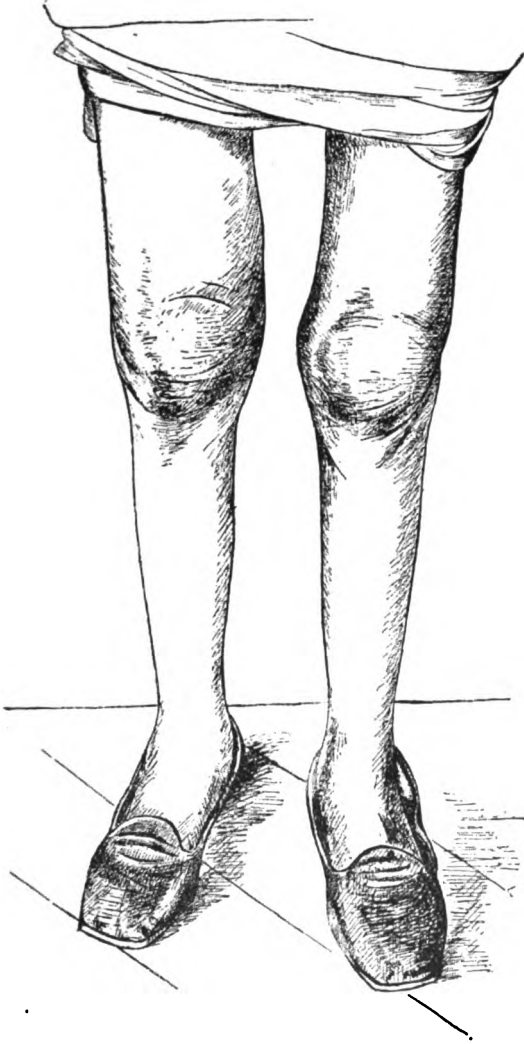


Lateral deviation of the spinal column associated with arthropathy of the wrists, etc. Same case as Fig. 5.

years ago, I found in the knee-joints the following appearances. The synovial membrane was mottled with blue patches and was covered with numerous small miliary calcareous nodules. The anterior edges of the condyles of the femur were greatly hypertrophied in nodular masses or rugosities. These formed bosses extending upward and outward. A large triangular mass of nodules, freely movable, was in the anterior notch between the condyles. These nodules were of stony hardness. The lining membrane of the joints was thickened and

rough in some places ; in others thin and eroded. In some places the membrane was absent, and the bone was worn and eroded. In brief most of the soft structures of the joints showed destructive changes.

FIG. 7.



Knees of same patient as in Figs. 5 and 6 after aspiration.

The semilunar cartilages were much worn and eroded and easily displaced. The inner structure of the capsular ligament showed pedunculated nodules. The crucial ligaments were wasted, but still held

slightly. The ends of the tibiæ were covered with thin, worn, and eroded membrane; parts of the surfaces of the bones were bare. The joints contained a thick, green, opaque fluid. The patellæ were deformed; they were thin and flattened, with rugous edges, and the under surfaces were covered with shreds of membrane. The capsular ligaments were much distended, and the joint-cavities extended to an abnormal distance upon the front of the femurs. This constituted the *hypertrophic* type of arthropathy: in the *atrophic* type, more common in the hip, the ends of the bones are sometimes entirely wasted away.

Arthropathies are not the only trophic lesions found in locomotor ataxia. We sometimes see what is known as a perforating ulcer. This is not a very common complication of tabes, and therefore I am fortunate in being able to show you a very good example of it to-day. I speak from my own experience only when I say that it is not common; this is not the opinion of some others, especially among the French. For instance, Marie asserts that it is common. It would seem not to be very common in America, judging from the little notice taken of it in our text-books and monographs. Glancing over some of the latest of these recently, I could find scarcely an allusion to perforating ulcer.

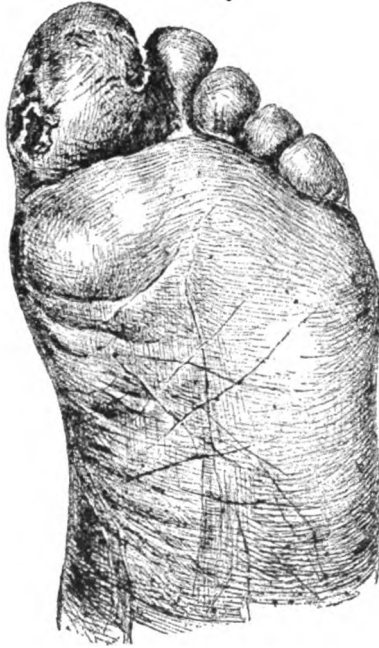
This lesion comes first as a slight induration, which soon breaks down in the centre and presents an ulcer. In mild cases it tends to heal rapidly and hence may escape notice; in more severe cases the ulceration proceeds and involves subcutaneous tissue, so that it may have the appearance of *perforating* deeply into the tissues. Hence its name. It does not tend to extend in a lateral direction. In grave cases it may even involve the underlying bones and contiguous joints, especially of the toes. But such severe cases are rare. I have never seen such a one in this hospital. The favorite seats for these ulcers are the sole of the foot and the lateral and underlying surfaces of the great toe. They may heal and leave scars. The case which I show to you to-day is an ordinary case of tabes, the details of which need not detain us.

A. B., male; aged about forty years; white. The patient has been tabetic for some years, presenting the usual sensori-motor symptoms of the disease. He presents (Fig. 8) a perforating ulcer on the inner and under aspect of the great toe of the left foot. This has persisted now for some weeks, being indolent with little disposition either to spread or to improve. It is not especially painful: in fact, it is associated with considerable tactile anæsthesia and analgesia, as these

ulcers, it seems to me, are rather apt to be. It does not communicate as yet with the bone or with the neighboring metatarso-phalangeal joint.

In conclusion I may say that it seems probable that these ulcers are

FIG. 8.



Perforating ulcer of the big toe in a case of *tabes dorsalis*.

started in many instances by traumata,—*i.e.*, by the bruises and pressure caused by an ataxic gait. The disease-process, once started, is doubtless favored by the low vitality of the tissues. The treatment is by a simple antiseptic dressing.

PARANOIA.

CLINICAL LECTURE DELIVERED AT KING'S COUNTY INSANE ASYLUM.

BY JOHN C. SHAW, M.D.,

Professor of Diseases of the Mind and Nervous System in the Long Island College Hospital; Consulting Neurologist to the Long Island College Hospital, St. Catharine's, St. John's, King's County Hospitals, and King's County Insane Asylum, etc.

GENTLEMEN,—The privilege of using the clinical material in this asylum has been given me by the Commissioners of Charities and Correction and the medical superintendent, Dr. Sylvester. It gives us the best opportunity for studying this class of nervous diseases.

The patients which I shall show you to-day are examples of a chronic mental disorder which is now known as paranoia. A large proportion of the insane belong to this class. This disease is slow in its development and usually steadily progressive. It is developed in those of decidedly neuropathic constitution. It indicates a mental degeneration, and the individual usually descends from insane ancestors. This neuropathic tendency is consequently very often manifested at a very early age. Evidences of it may be present before puberty, but it is most strikingly manifested about that time in over-sensitive, suspicious, often egotistical and presumptuous tendencies. Those afflicted are the prey of morbid, irresistible impulses.

There is an acute type of this disease, but I shall confine myself for the present entirely to the chronic form, which comprises the largest number of cases. In this group under consideration we may have those with hallucinations and those without hallucinations. In those suffering from hallucinations, that of hearing is the most common; next in order of frequency come hallucinations of hearing and vision; then of smell, taste, and tactile sensation. The patients I shall show you to-day are those suffering from hallucinations of hearing alone. Later in the course I shall show you patients with hallucinations of the other senses. The delirium which these patients present more commonly is

that of persecution, expansive or grandiose ideas, then hypochondriacal ideas. These are all delusions. Often the delusions of persecution last through the entire course of the disease, and this feature is a prominent part of the case. I shall show you a patient illustrating this fact. In others the expansive delusions are prominent from the beginning, and remain so during life. The delusions of persecution and the grandiose ideas are frequently mixed together. In others the condition which began with decided delusions of persecution later on assumes the expansive delirium, the delusions of persecution falling into the shade. The delirious ideas in these persons present what is known as systematized delusions,—that is, the ideas are grouped together logically to form a system.

CASE I.—This young man is twenty-three years old, and, as you see, looks healthy and robust. In our conversation with him you might have observed that he was at times a little reluctant to answer a question fully; it was necessary for me to cross-question him. There is a certain amount of defiant egotism in his bearing, although he often smiles when about to answer a question, indicating to us his confidence in his superior powers. He has been a soldier and a sailor in the service of this country. We have been unable to learn from him if any members of his father's or mother's family have been insane. His father is dead, and he shows a decided reluctance to say anything further about him. His mother is alive. When he was fifteen years old he heard voices speaking to him,—hallucinations of hearing. At times these voices threatened him. He is disinclined to tell us more about this early period of his life. He entered the army; during his service he heard these voices. They appear to have increased in frequency, possibly from the use of stimulants, until he became so insane that he was sent to the government hospital for the insane. After a certain length of time he was sufficiently improved to suppress to a certain extent these hallucinations of hearing and delusions which he evidently had; he had sufficient control to fight against them. As he desired to get out of the asylum, he saw the advantage of denying that he heard these voices and had false ideas. He was able to do this so well that he was discharged, and I infer, with the idea that he had recovered. Not long after he enlisted in the United States navy, which he could not have done if he had been reported as insane. He says that before he was enlisted they communicated with the officers of the government hospital. This all shows how cunning these patients sometimes are in misleading even those who know them well, and are familiar with the insane. He never ceased, he tells us, to hear the voices, or have his

delusions of persecution, although he concealed them so well as to obtain his discharge. In the time at our disposal we have been unable to learn accurately about his insane manifestations in the navy, but he was undoubtedly before his discharge in the condition he now is. He tells us, "He has been discharged from the army and navy because he knows too much." He is in possession of information about the officers of the Army and Navy Departments which they are afraid he will make known to the public; therefore they wish to get rid of him,—to kill him,—but he says in a defiant, self-confident manner that "they could not kill him, he knows too much for them." When questioned, he will not say how he has come in possession of this information or what is the wrong which is being perpetrated. He admits that he now hears voices threatening him. When asked why, if he has this information of wrong-doing in the departments of the army and navy, he does not communicate it to the President, his reply is, "The President and all the high officials in Washington are in with them." When told that this is impossible, he says, "It is so," and he need not write to the President,—he can telegraph to him. When asked why he does not send the telegram, he says, "I do not need to do so, I can telegraph to him on my fingers," at the same time making motions with his fingers. He says, "What they (meaning these officials) wanted was to have me commit a murder, then they think they would have me, but I am too smart for them."

This, gentlemen, is a case with hallucinations of hearing, upon which are developed the delusions of persecution, and later the extravagant ideas of his own ability. These delirious ideas are probably fully systematized, but he conceals from us a full statement of them. This is very frequently the case with the hallucinatory type of paranoia. The reasons for this concealment are obvious. They are in doubt as to whom they are speaking,—we may be some of these persecutors seeking information upon which some injury can be done him. He views every one and everything that is said with suspicion.

These are always dangerous patients. They may kill with the idea of defending themselves, or they may do so with the idea of redressing some great public wrong, which they expect in that way to bring to public notice. The delusions of persecution are always strong in this class of cases. In some the danger of their doing violence to others is not as great as it is shown in this young man.

CASE II.—This man tells us that he has lived in Missouri. His wife died, and he lived for some time with his servant-girl, and a child was born to them. This created an unpleasant scandal in the town,

and in consequence he removed to St. Louis. He says it was on the train to St. Louis that he for the first time heard voices threatening him,—hallucinations of hearing. These voices called him "Tuck," and that has been the name they have designated him by ever since. While in St. Louis his little girl became sick, and the doctor advised him to take her to the sea-shore, and he set out for New York. (It appears to me highly probable that the hallucinations of hearing had more to do with his leaving St. Louis for New York than the advice of his physician.) He started with the two children and their mother, whom he speaks of as Miss Miller, or Lil. When riding in the omnibus to the railroad depot in St. Louis, he saw a newsboy and bought a newspaper of him. He saw described in it a tragedy,—a murder; a man named C. H. Paten had murdered another man in Cincinnati, Ohio. He read it aloud to the other passengers, and told them that was his name, and said that some one either in the omnibus or not far away must have had this put in the paper, giving his name as the perpetrator of this tragedy. He arrived later in New York, and as he was about to get off the train at Hoboken, he heard some one say, "Frank, just as soon as he gets into New York I will arrest him." He turned to his wife and said, "Lil, that is just what I want them to do; then I will find out who these wretches are." He went to a hotel in New York, and while in the dining-room a man walked up to the proprietor and said, "You have a family of Kentuckians stopping here?" The proprietor said, "No," and the man with his party, five or six others, left the room. This was undoubtedly a hallucination of hearing. The patient attributed the inquiry to a man whom he saw. These patients will frequently do so. The patient here states that that was the first time he had ever seen the persons who he had heard speaking to and of him in the last ten years. He attempted to find work at his trade of painter and paper-hanging, but he found that this conspiracy to identify him with the murder had already reached New York; it was in the papers and everybody knew about it. He then went to a station-house in Brooklyn and told the captain that he had only recently arrived in the city, and there was evidently a conspiracy against him, the nature of which he did not know. He soon found that the man who was persecuting him kept a team of "dapple grays" at a livery-stable in Liberty Street, and at the "dead hour of night" he would take them out and drive them with a friend, whom he called "Frank," through the streets, lowering the windows of the carriage and cry out, "Fresh telegrams from Cincinnati?" "Fresh telegrams from Louisville, Kentucky?" and Frank would sing out, "Keep cool; we will have him yet!" He

states that later on he heard one night this same man swear in twenty-five men for the purpose of lynching him. The patient is positive that he heard this oath administered, and heard the men say that they thought twenty-five of them ought to be able to get rid of him. He also states that the officer in the police station heard the oath administered. He also heard a conversation between this police officer and the head man of this conspiracy.

This conversation is of interest not alone as evidence of hallucinations of hearing, but as showing the patient's exalted idea of himself and his immediate family. He rarely expresses extravagant ideas.

These are the patient's exact words :

Stranger : Have you ever met this man ?

Police Officer : Yes, I have been in his house.

Stranger : What do you think of him ?

Police Officer : He is a perfect gentleman.

Stranger : What do you think of his wife ?

Police Officer : She is a perfect queen.

Stranger : What do you think of his children ?

Police Officer : They are two of the prettiest children in Brooklyn.

Stranger : How has he got his house furnished ?

Police Officer : Like a king ; fine set of black walnut furniture.

We could spend very many hours talking with this patient about his hallucinations and delusions, but it would be essentially a repetition of what he has told us. He at no time showed the aggressive, vindictive tendencies towards his supposed persecutors which the young man does. He is satisfied in calling these persecutors "wretches." The hallucinations of hearing and delusions of persecution have existed in this man for more than twenty years. The grandiose ideas are very mild indeed ; it is very rare that he expresses even those which he has. They are decidedly in the shade in this patient. I am satisfied, however, that the exalted idea of his own ability is more decided than appears. For instance, in talking of his hallucinations, etc., he will at times become quite animated and plunge deeply into the subject, during which he will mix up with his recital of what the voices say an account of his adventures with these persecutors, and his valor in defending himself. This is an embellishment of the subject, the outcome of his exalted egotism, and has no direct connection with his hallucinations. He makes these statements very much in the same manner that a boastful sane man does, and for the same reason. They are really not a part of his delusions strictly speaking, but the outcome of his natural egotism.

CASE III.—In this case a history of the patient must suffice, as I cannot show you the individual, as he is not at this time in the asylum. It is an exceedingly interesting case and typical of this class of cases. He says he has been in the habit of taking from five to six grains of opium at a time. He commenced the habit a number of years ago after taking opium for an attack of dysentery. Says his name was formerly T. D. Powers, but two years ago, learning that his name was La Poer, of Scandinavian origin, which his Irish ancestors had changed into Powers, he assumed the name of La Poer, and his children assumed it also. Says the "La" is a sign of nobility, but does not know the derivation of Poer. Admits that he found this change of name upon a newspaper article, and not upon any researches of his own. Patient says that he was born in Montgomery County, New York, and farmed there until he was twenty-six years of age, when he married and moved to Illinois; farmed there for a while, but, suffering intensely from malarial fever, had to stop farming, and then worked in a machine-shop in Chicago. Since then the greater part of his time has been spent in Chicago and St. Louis, but he spent one year in New Orleans, some months in Minnesota and in the Black Hills. Patient has a very good opinion of himself. Says that some men get old, but that he does not, and he would not be surprised if he lived a thousand years. Says that he has been almost everything,—minister, lawyer, mechanic, miner, pattern-maker, agent, etc., and that he could learn to do any trade. He once thought of learning the art of engraving, but he did not, as he knew he would become very skilful, and he would be tempted to become a counterfeiter, but he did not wish to become dishonest. Patient claims to have dreams, revelations, and inspirations, and these all come to him from a divine Being. Does not believe in Christianity; says it is all bosh; nor is he a Spiritualist, as he does not believe in spirits. The Materialists are also wrong, for things were never evolved, but created, and where there is a design there must be a designer. He does believe there is a great and good Being, who created all things and cares for mankind. This Being is particularly interested in him, and sends him his peculiar dreams. The first time that he revealed himself to the patient was after a camp-meeting, when he came and stood by his side and laid his hand on his head. Says that he was not afraid of him, but felt drawn towards him; to use patient's own words, "He seemed like a friend who would help a fellow home after he had taken a glass too much." In this vision he then saw heaven and the angels, and God as an intense white light. He then felt as if he had strength in him to convert the world,

and commenced praying so loud that he was heard five miles away. When the dream had passed away he felt as if he was not called to be a minister, but to go out West. He then selected his wife, and had hard work to get her, as the minister's brother wanted her, and the minister refused to marry the patient to her. But he succeeded, as he said he always did. Has had numerous dreams and revelations, but said that he could not tell me all about them, except that they always came true. He says they are not due to his opium-eating; that he has tried to cause them by taking large doses, but has never succeeded. Says that he is in a half-waking and half-sleeping condition; never hears any voices, but could see the scene, and the consciousness of what it means comes to him and he wakes up. While in New Orleans he one day returned to his boarding-house, and in the dining-room fell into a doze. He thought he tried to get on a street-car, but it passed him; he had to wait for a second; this he took for a sign that he would always succeed the second time, but never the first. He was awakened from this dream by a sharp noise, and looking at the lamp, which was not lighted, saw that a narrow ring of the glass chimney had split off, but was still resting on the chimney. This he took to be a very favorable sign, and he has carried the ring ever since as a talisman. It is found among his effects in an ingeniously-fitted brass box. When in St. Louis he applied, at the advice of his friends, for a government position. While trying to get the place he had a dream, which told him he would be unsuccessful. He was in a room with a small land-turtle, which had on the front of its shell a bright shining object about the size of a silver half-dollar. This he tried to obtain and chased the turtle around the room, but could not catch him, and, true enough, he did not get the position. In another dream he saw a fountain in a valley in the Black Hills which ran gold. He went out there, and was one day walking with his brother-in-law, but diverged from the path and soon came across the fountain which he had seen in his dream. He immediately commenced work and staked out a claim, but, owing to a severe dysentery, was compelled to stop. He still holds his claim, and says that, although others failed to find gold both above and below him in the same valley, he is sure that underneath a certain geological stratum he will find a thick layer of gold. To obtain money to dig for this gold, he came to New York to marry a rich wife. This he was also led to do by a dream. He described it as the most beautiful dream he ever had. It was a beautiful lake, with exquisite natural surroundings, and on the bosom of the lake floated two lovely swans. These he interprets as representing beautiful, rich ladies, one of whom he is to

marry. The first swan he supposed to be a wealthy maiden lady whom he once saw, twelve years ago, in a church in Chicago, and who is now living in New York. This lady he is determined to marry by all means, and has had many dreams about her. In one of them he was at a grand party and she passed by him, and some one said, "Beautiful but unhappy Miss Dallas." This he said was not her right name, and it made him think there was some mystery in her life. This was cleared up in another dream when he saw her uncle, a wealthy bachelor, standing by the bed of a woman who had just been confined. He therefore concluded that the lady is the illegitimate child of her supposed uncle,—she is aware of the fact, and is very unhappy about it. Thereupon he writes twice to the lady from Chicago, but his letters are returned, and he comes himself to New York to see her, not having seen her for twelve years. He called at the house, but she was out: he called again, but her mother said he could not see her. He then paid the servant to take his picture and a letter to the lady, but she returned both unopened. This he took as an unfavorable sign, but he wrote her ten pages of foolscap, explaining his situation, when he heard a voice say, "Success lies in the door-way,—there lies the Roman lady." He also heard another voice say, "From the chamber whence I have called thee there is but one opening." He said this referred to the lady; he is the opening, and he intends to hold it. This sentence he seems especially fond of repeating. By this time his attentions had undoubtedly alarmed the lady and her friends, and they put the detectives on his track, which led to his arrest and commitment as a lunatic. This La Poer considers as a persecution on the part of her friends, for he knows the lady wishes to marry him, as he saw her in a dream the other night, and she said that she would marry anybody. Patient met her brother once and made an appointment to meet him again, but, fearing foul play, he (the patient) did not keep it. To defend himself in case he should be attacked, he carried an ordinary file with the teeth smoothed off, and the edges and point ground very keen. To this he had fitted a good handle. As patient significantly remarked, that if it did not strike a rib, it was so sharp that it would go right through and pierce a man's heart, without making much of a wound. Said that another good way to kill a person without being detected would be to make them inhale carbonic acid gas when they were asleep. Says he has had many severe sicknesses,—diarrhœa, dysentery, remittent fever, typhoid pneumonia, pleurisy, and lastly syphilis, the secondary symptoms of which are now manifest. Patient has evidently been a very immoral, half-insane adventurer. A man nat-

urally clever, with fair reasoning powers and perceptive faculties, without any education, has gathered a large amount of miscellaneous information, and thinks he knows everything. He thinks he has a great mission before him, and that as Columbus revolutionized the mediæval idea of the physical world, he is to revolutionize the intellectual world, and, he says, "Burst the bands with which Christianity and bigotry have bound the intellect of the world." When talking on this subject patient becomes somewhat excited, and talks loudly and gesticulates a good deal. Usually talks quietly and smiles a great deal, in a self-satisfied manner.

When asked what he will do about the lady, now that he is going to Chicago, says that she was the first swan of his dream, and that he will soon meet the second and succeed, as he always does the second time. Says he thanks Providence for having him arrested, as it has enabled him to break off the cursed opium habit. To obtain some facts about his past history, the clergyman in New York, whom he represented as his friend, was called upon. The clergyman stated that he knew La Poer very slightly in Chicago, only having seen him in his church. That patient called on him about two weeks ago and stated that he was going to marry this lady, and wanted him to go and see her, which the clergyman did after patient's arrest, and found the above statements of the patient essentially correct. That the lady and her friends had been very much annoyed and frightened by La Poer's demand and obnoxious attentions, and had caused his arrest. When asked what he thought about Guiteau, said he did not know him, and had never seen his picture, so that he had not formed any opinion of him. But he did a good thing when he killed Garfield. Garfield was not one of his (La Poer's) kind, but was animated by an evil spirit which showed itself in his face and actions. Arthur, on the contrary, was one of his kind, the good kind, and he wished him all success. He is sent to Chicago.

Received a letter from patient dated Chicago, out of which I take the following extracts :

"Looking back over the past four weeks it seems to me to be a miracle from beginning to end, if, and it can be said to have that which I really went to do, I did, and that was two things, first to get an expression from a person, and from her directly and without the intervention of others. That expression I got. (Underscored with lead-pencil.) It makes no difference what it was, it is not an element of the problem. I think I told you what had been said to me in reference to the chamber. That was some days before I started from here. The

words were these, 'From the chamber from which I have called her there is but one opening.' The second thing I wished to do was to get possession of that opening, and that I did, and that passage I hold most effectually, and intend to hold forever. But there were two swans on the beautiful fountain. I have passed the brown one and am now in sight of the white one. My being compelled to come through Canada against my will brought me within sight of her; a lady that I scarcely knew of her existence until within the last week, when I saw her name in print. She lives across the ocean. I would not dare to give you the most distant idea who she is, but I have already been announced at the door of her chamber, and she arose and came forward to receive me. How long I have to wait to know about it I don't know. But I had conceived the idea of crossing the Atlantic before her name was brought to my notice, and when I have succeeded on the other side of the ocean I will show you what it means. There is a mother on that side who will be very loth to give way, but I believe that I have the power to bend her, and rest assured I will, for I have already one mother who had as much strength as that one, if not more, and I have already told her that it will be useless for her to attempt to resist me. But I must draw this to a close. What I hope for will require time for its fulfilment. I have faith in myself, and also in Him whom I believe to be my Father. I believe there is a deep meaning in my being sent to Flatbush. The last day but one that I was there I was honored by the queen, and no other gentleman ever got from her what I did since she has been there. I do not care to have many others than yourself see this. I wish you to preserve it, as I have no copy of it, and if I fulfil what I have foreshadowed in it, it will be a witness for me."

In this last case we have the well-marked grandiose ideas, with slight delusions of persecution. He evidently never has had any hallucinations of any of the senses. He suffers from a purely intellectual disorder. The influence which dreams may have in the development of false ideas is apparent in this case. We have also an instance of the projection of the dream state into the waking state. These three cases show a peculiarity in the sufferers from this mental disorder: an uncontrollable desire to wander from place to place, either as the result of impulse, restlessness, or in obedience to their hallucinations or delusions, or to avoid, if possible, their persecutors.

I shall show you later other cases of this disease. For the present I wish to remind you again that these persons are always dangerous. Persons with delusions of persecution are always to be looked upon with suspicion. Confinement in an asylum is the proper thing for

them. Treatment has no permanent result with these persons. At times, in the early stages, improvement may take place, either by careful attention to diet, the avoidance of stimulants and other excitements, the use of moderate doses of bromide of sodium, and directing the attention and thoughts of the person into more healthy channels, as far as it is possible to do so. There are times when the hallucinations are very marked in these persons. It is impossible to explain satisfactorily why they should suddenly take on such activity. Under these circumstances they are extra dangerous.

Surgery.

COLLES'S LAW IN SYPHILIS.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL SAINT LOUIS.

BY PROFESSOR FOURNIER, M.D.,

Clinical Professor of Diseases of the Skin and of Syphilography in the Faculty of Medicine; Visiting Physician to the Hospital Saint Louis, Paris, France.

GENTLEMEN,—I wish to speak to you to-day of an important as well as interesting phenomenon known in syphilography under the name of Colles's law.

Physicians occasionally meet with the following strange spectacle. A woman may be seen holding in her arms a child covered with the eruption of syphilis and presenting in its mouth a number of mucous patches; and this woman—this mother—who gives her breast to this child is absolutely healthy, the most minute and careful examinations failing to reveal any symptom which enables one even to suspect syphilis. Repeated examinations after prolonged observation always end in a negative result. This mother, as I have said, nurses her child, her breast is constantly in contact with the mouth of the little syphilitic; nevertheless, no contagion is produced. I will cite one example among many others. A short time since a young woman, married to a man unquestionably syphilitic, came to our clinic, as she had been confined, and brought us her child to examine. The child was covered with mucous patches upon the genital organs and in the mouth. Having been told that she was nursing the child, we examined her breasts,—they were absolutely healthy. She remained in our service over five months, continuing to nurse her child, and during all this time, notwithstanding frequent and careful examinations, we were unable to discover any syphilitic symptom in the mother. We have here a remarkable fact. A syphilitic child, the offspring of a syphilitic father, is nursed by the mother, and the latter remains healthy. We ask ourselves, How is it that, in defiance of all logic and common

sense, contagion does not occur in this case. If such cases were exceptional and only rarely presented themselves, we might be inclined to doubt the fact or to suppose some special immunity existed in the mother, but no, on the contrary, they are often met with in our practice. We are not dealing with an exception but with a fixed fact, so incontestably fixed, indeed, that it is called a law,—the law of Colles, which may be formulated as follows :

“A mother nursing a syphilitic child, the offspring of a syphilitic father, never contracts syphilis,” or, “a child procreated by a syphilitic father never gives syphilis to the mother.”

This law, as I have said, is called the law of Colles, having been given the name of the Irish physician who is believed to have been the first to formulate it. Colles is the author of a work published in 1837, entitled “Observations upon Venereal Diseases.” It is more than probable, however, that Colles did not understand the precise meaning of this law, and it was a French physician, Beaumetz, who, in 1840, explained it more clearly, and we, therefore, consider it only right to call it the law of Colles-Beaumetz.

So much for the bare incontestable fact. It is important to note it, but it will not suffice to let the matter rest there. We must try to find some interpretation for it. The explanation is not difficult ; it is not necessary to look long and to bother our brains to arrive at the solution. There exists, indeed, a fact absolutely certain and proven, both clinically and experimentally, for a long time,—namely, that in order to escape all danger of syphilis, and to come out victorious, there is only one infallible guarantee, which is to have it already. This, as I have already said, has been fully demonstrated, therefore you will never see a syphilitic contract syphilis, and, on the other hand, you may inoculate a syphilitic with the pus of mucous patches or of a chancre without causing syphilis. I, like many others, have tried this, but it was time lost : never did I obtain the slightest result. I daily allow my students to make this experiment, since it is in no way dangerous, but none have ever had any positive result. Syphilis therefore does not reoccur. Let us then apply these results to the problem which we are endeavoring to solve. Here is a woman having given birth to a syphilitic child, which she is nursing, and yet she does not contract the disease,—Why ? Because this woman is syphilitic ! This is, however, merely a supposition, and between the supposition and its demonstration there is a wide gulf. How are we to prove our theory ? There is evidently only one way of doing so, and that is by inoculating with syphilis. The inoculation once made, we either witness the de-

velopment of syphilitic symptoms, in which case we may be certain that the woman was not a syphilitic, or, if nothing is produced, we are forced to admit that she is already under the influence of syphilis. This experiment, important as it is for the solving of our problem, is very tempting. But if the physician might be tempted, the honest man cannot agree to such practices. Morality and conscience cry out against it. Therefore no one in France has made this experiment. But that which we have not dared to do here has been done in Germany, and while it is not for us to discuss this point at length, it is our duty, on the contrary, to recognize the facts and to appreciate their value, as well as to inquire whether they may not furnish us with the proof we are in search of.

The following is the first case reported by Kaspari. A married man, forty years old, contracted syphilis in 1872. The wife, being cognizant of the fact, abstained from all intercourse with her husband. Two years later, the husband being cured, she returned to him, became pregnant and gave birth to a syphilitic child.

Kaspari hesitated, not knowing what he should do. He deliberated as to whether or no he should treat the woman, and finally decided to inoculate her with pus from mucous patches. This, I must tell you, was done with the full consent of the patient. What was the result? No infection occurred.

The case reported by Newmann is even more characteristic. It was that of a young woman who had given birth to a syphilitic child. The presence of syphilis in the child was unquestionable, and, as a proof of this, I must tell you that the grandmother, who, like all grandmothers, was constantly kissing her little grandchild, contracted an indurated chancre of the lip. Newmann, like Kaspari, decided to inoculate his patient, and he did this thoroughly,—making not only one inoculation, but—note the number—sixteen. They were made upon all parts of the body with pus from mucous patches and indurated chancres. As in Kaspari's case, there was absolutely no result, the woman remaining healthy. I should add that Newmann had the patient under observation for six months, quite a long period, as you see. To these cases are added three others cited by Finger, which I shall not narrate, since they are the exact counterpart of those already given. We here, then, have five cases which prove incontestably that the mother, under the conditions mentioned, is syphilitic, and we may deduce the following conclusion: a healthy woman having a syphilitic child by a husband having syphilis, has nothing to fear from her child, for the simple reason that *she is herself a syphilitic*.

This fact being established, what questions will present themselves? How did this syphilis originate? What manner of disease is this which remains inactive, and what is the prognosis? At first we might be inclined to think that we had before us a case of hereditary syphilis, but this theory does not hold good, from the fact that hereditary syphilis manifests itself by special signs and characteristic eruptions. Or we may say that syphilis has been present unperceived. This is not impossible, but such cases are quite exceptional,—hence this hypothesis is insufficient. Only one theory now remains before us, which is that the mother has become infected with syphilis while carrying the infant.

This form of syphilis which I call “silent” was entirely unknown before the works of Colles and of Beaumetz. Up to that time only the classic active syphilis manifesting itself by exact and characteristic signs was recognized. You see, therefore, that the idea of this peculiar form of syphilis is a triumph of modern science. Now, what is to be the future of this special syphilis? Silent in the beginning, will it remain so a long time? Our observations give a satisfactory answer to this question, at least as far as concerns a certain period. Cases have been observed in which not the slightest manifestation of syphilis occurred during a period of time varying from one to fifteen years. I will give you several examples. A woman had seven miscarriages, gave birth to three syphilitic children, and remained healthy during fifteen years. In another case, almost identical, the woman gave birth to four syphilitic children and had two miscarriages, and she likewise remained in good health during fifteen years. This then gives a period during which the syphilis may remain silent. But beyond this? It is impossible for us to determine this of a certainty, but it is probable that this quiescence is not indefinite. Hutchinson was the first to call attention to the cases in which tertiary symptoms present themselves after a long “silent” period. I will now cite the celebrated case of Charrier, which was that of a young woman, married to a syphilitic husband, who was confined of a syphilitic child. During six years this woman remained in excellent health, and did not develop the slightest suspicious symptom. Then an ovoid tumor appeared upon the forearm, which was at first hard, but afterwards softened, opened, and presented all the characteristics of a gummatous ulcer. This, moreover, was the diagnosis made by all the experienced physicians who saw this patient. Barthelemy reported two similar cases. This appears to be a form of tardy hereditary syphilis, such as is observed in children. You probably know that in children two varieties of

hereditary syphilis occur. Either the child is born with specific symptoms—immediate or precocious syphilis—or nothing presents itself at the time of birth, and the child develops without any indication of ill health, and at about the twentieth year or even later, syphilis manifests itself in the form of tertiary symptoms. This is tardy hereditary syphilis, and the same thing may exist in the mother. She may also present a variety which can be termed precocious. I speak of the cases in which a pregnant woman develops specific symptoms during the course of her pregnancy. This is, so to speak, a decapitated syphilis; the initial symptom, the chancre, is absent, but the others leave no doubt as to the true character of the malady. This, then, is precocious hereditary syphilis. The opposite variety, that with which we are at present occupied, is a tardy hereditary syphilis. This is the theory which predominates at present, and which appears to be based upon facts. As for myself, I believe it to be irreproachable so far. A last point now remains to be considered.

Have cases been observed which might be considered as exceptions to the Colles-Beaumetz law? Yes, but only a very few, half a dozen at the most, and even some of these are not very reliable. Among the most interesting the following one may be mentioned:

A woman who gave birth to a syphilitic child contracted a mammary chancre while nursing the infant.

Personally, I have never met with such a case, but, because one has not seen a thing one must not conclude that it does not exist. When we consider that these cases have been observed by very distinguished and experienced physicians, in whom every confidence can be placed, we must recognize their possible existence. They must, however, be considered as exceptions. Before concluding this lecture let us recapitulate the facts. Three conditions may present themselves in the mother.

1. The mother may acquire syphilis from her child and present syphilitic symptoms (excepting the chancre) during the pregnancy. This is precocious hereditary syphilis.

2. The syphilis remains quiescent notwithstanding the nursing of a child covered with syphilitic symptoms. This is latent hereditary syphilis.

3. The woman escapes infection although carrying a syphilitic child, but she remains susceptible to it, and forms an exception to the Colles-Beaumetz law. I have already told you that this possibility must be accepted with some little reserve. Further observations are necessary before the problem will be definitely settled either one way or the other.

There are some practical points, moreover, to be borne in mind. The mother of a syphilitic child should be its only nurse, and this for two reasons. Firstly, if it is given to another woman to be nursed, she will most surely become infected. There will thus be a new victim to the disease. Secondly, the mother has absolutely nothing to fear through the act of nursing her child. She may do this without the slightest danger, since she is already syphilitic, and can no longer acquire the disease. Therefore, after you have heard the confession of the husband, who may be entirely ignorant of the danger to which the nourishing of his child may subject a nurse (and this is frequently the case) you should enlighten him upon the subject and make him understand that it is his duty not to engage a wet-nurse. He must persuade his wife to nurse her child herself. This is of capital importance. Your professional duty requires you to act in this way, which you are sure to do when you bear in mind the social peril, and the necessity of preserving a fellow-being from such a serious danger. Remember that it is in the interest of all to block up, as it were, the centres of contagion, to prevent contamination, and thus to avoid as far as possible the spreading of the germs of this very serious affection.

CALCULOUS PYELITIS, MULTIPLE RENAL ABSCESS, NEPHRECTOMY.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY ROSWELL PARK, A.M., M.D.,

Professor of Surgery in the University of Buffalo, New York, etc.

GENTLEMEN,—This patient is a man of English nativity, thirty-five years old. I saw him for the first time seven or eight weeks ago, and advised an operation for the sake of removing a badly-diseased kidney. He has delayed partly through dread of the operation, partly because, after concluding to submit to an operation, he wished to wind up his affairs, a reason which he has considered more urgent than I have, for I expect that, in spite of the serious nature of the procedure, he will recover.

The history is about as follows: Some six years ago his first complaints began, but they were so vague that we can make little out of them beyond the mere fact that he felt badly. At this time his urine was examined by a physician, who reported to him that it was abnormal, but he does not know in what respect. About three years ago his symptoms seemed to become more and more referable to the bladder, or at least to the urinary organs. He was treated at that time for cystitis, the diagnosis apparently resting on his complaint of frequent and painful urination. These symptoms have become aggravated in every respect; especially during the last year has he complained of great pain, which now does not centre so much in the region of the bladder as in the back, right side, and, in short, in the region of the right kidney. Quite recently the steadily-increasing pain has extended to the groin. He cannot lie on the left side, but must rest on the right side or back. An analysis of a twenty-four hour sample of urine has resulted as follows: one thousand cubic centimetres, acid, and that is noteworthy; specific gravity, 1020; urea, twenty-five grammes; albumen present; no sugar; a great deal of pus. The albumen is readily accounted for by the presence of pus, and there is nothing microscopically

to indicate the implication of both kidneys in a general disease. Is the trouble primarily with the bladder or with the kidney? The patient has had repeated attacks of renal colic in the past three years, and once, about two years ago, he passed a small phosphatic calculus. There is no history of trouble beginning with the bladder or prostate, and gradually damming back the urine, so as to cause a hydronephrosis, or of any infectious process, such as gonorrhœa, extending upward along the urinary tract. I believe, therefore, that the condition is primary in the kidney; that whatever symptoms he has had that have been referred to the bladder are due to reflex irritation and that of the urine as it has come from the kidney. When I examined the patient there was excessive tenderness over the right kidney, and I could feel a distinct tumor in this location, though the excruciating pain made it impossible for me to map out the tumor exactly. If the patient had now any degree of cystitis, we should expect to find the urine alkaline and decomposed, and I can hardly believe that he has had a cystitis of any moment without leaving more evidence in the present condition of the bladder. In brief, the history is this: a man with increasing urinary disease, without obvious cause or positive indication of direct involvement of the bladder, with evidence of renal calculus, at least in the past and probably still remaining in large part, with urine containing pus, which we cannot ascribe to the bladder, and must, practically speaking, refer to the kidney, with a distinct and excessively sensitive tumor in the region of one kidney. All this points with scarcely the possibility of error to renal disease. The exact condition may be calculous pyelonephritis, or it may have gone on to the formation of multiple abscesses in the kidney, or the damming back of urine containing pus, by a calculus lodged in the pelvis or ureter, may have caused more or less sacculation of the kidney, which may appropriately be termed pyonephrosis. If there were no pus present, we should speak of the condition as hydronephrosis. When any such condition is due primarily to calculus, the term calculous is used as a kind of prefix, and we speak of calculous pyelitis, calculous hydronephrosis, etc. I am quite confident that we have to deal with calculous disease of the kidney which has caused an accumulation of purulent urine; but whether the trouble is more accurately a pyonephrosis or multiple abscesses, I do not pretend to decide till the operation is nearly or quite completed, and we have a chance to examine the kidney and its contents.

Within the past three or four weeks the patient has developed more and more of a hectic condition. His temperature has been dis-

tinctly, though not excessively, elevated, and he has had chilly sensations, though no positive rigors. His appearance plainly indicates auto-intoxication, and he is in a less favorable state for operation than he was when I first saw him. This, however, is his fault and not mine, and I do not believe that anything would be gained by still further delaying the removal of the septic contents of the kidney in the attempt to prepare the patient for operation. He is steadily losing ground, and must inevitably die if not speedily relieved.

Even now, as you look at the abdomen, you can see that the right side is perceptibly larger than the left. The skin is shaved, scrubbed, and disinfected, and the area of operation inclosed by bichloride towels. The kidney is usually exposed, for simple operative procedures and even sometimes for removal, by a longitudinal incision three inches externally to the line of spinous processes, and passing just to the outside of the quadratus lumborum. But this simple method does not give sufficient access to a kidney in the state of this one. It is possible to remove a kidney through an anterior incision, but this method entails injury of the peritoneum both in front and behind, and the possibility of infection by a few drops of pus or the slightest relaxation of asepsis, so that an extraperitoneal incision is to be preferred wherever possible. There is also a difficulty in securing proper drainage after attacking the kidney from the front. Almost the only cases in which the anterior abdominal incision is justifiable are those occurring in little children, where there is not room for the posterior operation.

I remember one child upon which I operated in this hospital years ago. The child was only twenty-three months old, and was, at the time, the youngest patient ever successfully operated upon for this purpose. It had an enormous tumor, which protruded and practically hung out of the abdominal cavity in front, an abdominal supporter being necessary to keep it in place. In that case it was, of course, necessary to make the incision in front and to open the peritoneum both in front and behind. No tumor could have come out of its bed more easily than did that one, and it was the work of but a few minutes to strip it free from its capsule, ligate the vessels, and close the outer wound. The condition proved to be a fibrocystic kidney, such as we should now consider an adenoma of the kidney of congenital origin. At the time this was the only successful case of total extirpation of the kidney for this disease in so young a child.

In the present instance I shall resort to the incision popularized by Kōnig. This is curvilinear, and is practically parallel with the ribs or the crest of the ilium, beginning well back near the spine and con-

tinuing far enough forward to allow easy access to the kidney. I will show you as much of the operation as is possible, but I shall myself have to be guided largely by the sense of touch. Both to check oozing and to avoid infecting any more of the wound than is necessary, I pack the extremity of it with antiseptic gauze. The wound is held open with retractors. With my fingers I am separating the kidney from its adhesions. It is an enormous organ and it is soft to the touch, except that I can feel a calculus inside, but I do not yet know the exact condition with which we have to deal. I do not want to know the nature of the contents of the kidney till it is removed, as I am sure they would prove harmful, but I am afraid that I shall not be able to peel out this large and soft organ without rupturing it and allowing some pus to escape. The only serious danger of hemorrhage, in such a case as this, is from the great vessels of the hilum. These vessels I shall constrict not with ordinary ligations but with an elastic cord, which will exert a continuous pressure. It is a difficult matter to pass this elastic ligature around the vessels at the bottom of a narrow wound. Even the physical exertion is considerable. The patient, who has thus far been in the left latero-prone posture, is turned nearly onto the right side, so that gravity may aid the extraction of the kidney from the wound, and so that any pus which may escape may flow outward. This precaution has not been in vain, for here, you see, I have ruptured the thin wall of renal structure at one point, and a quantity of thick, bloody, grumous pus of foul odor issues. We will now save time by evacuating what pus we conveniently can, and about one hundred cubic centimetres have escaped into the basin. I can now establish the diagnosis of multiple abscess, the result of calculous pyelonephritis. Now, after turning the kidney as far out of the wound as possible, I must give some attention to tightening the ligature before severing the organ from its vessels. The kidney, in spite of the evacuation of pus, is still twice its normal dimensions. The calculus is evidently phosphatic, and makes a complete cast of the pelvis and calyces, aggregating the size of a hen's egg, but presenting a beautifully branched appearance. It would be difficult to imagine a case in which the explanation of the past sufferings of the patient was clearer or in which the justification for surgical interference was more eloquent. The question now presents itself, Have I opened the peritoneal cavity? So far as I can tell by my sense of touch, I have not. If I had, I should introduce a drainage-tube, after cleansing the wound, as I do now, with the spray of hydrogen peroxide. There is left a cavity into which I can easily place my fist. Shall I close it? Experience has shown that, with patients lying on

the back, as they naturally do after operation, such a cavity will heal quite as quickly without much suturing. The walls lie in apposition, and healing is facilitated by the free escape of contained fluids. Moreover, if any septic matter should be retained in the wound, or if secondary hemorrhage should occur, access is easy by simply removing the dressing and the antiseptic gauze with which the wound is packed. I am examining once more to make sure that the elastic ligature is tight and that the peritoneum has not been penetrated. I have not broken through into the peritoneum, but I have burrowed so deeply behind it that I can feel the inferior vena cava and the aorta, and could easily control the circulation in the lower part of the body, if there were any reason for doing so. Into this deep pocket I am pushing a swab of gauze soaked in hydrogen peroxide solution. I take care to remove all this gauze before putting in the regular packing of the wound, which will be in one piece, except that it is necessary to leave in a couple of hæmostats, and about these is wrapped a piece of iodoform gauze, so that they may be extracted day after to-morrow without disturbing the rest of the dressing. I have cauterized the open end of the ureter, both to expedite its closure by inflammation and prevent communication between it and the wound, and because the cauterization will render its tissues less likely to absorb any deleterious matters that may form in the cavity. In two days the vessels will have become sufficiently obliterated by the organization of blood-clot, so that it will be safe to remove the hæmostats. Over the packing of plain sterilized gauze an ordinary antiseptic pad and bandage will be applied.

[The patient rallied satisfactorily and did well in every particular.]

IRREDUCIBLE HERNIA.

CLINICAL LECTURE DELIVERED AT ST. GEORGE'S HOSPITAL.

BY WARRINGTON HAWARD, F.R.C.S. (Eng.).

Surgeon to and Lecturer on Clinical Surgery at St. George's Hospital, London,
England.

GENTLEMEN,—There has been a series of cases of irreducible hernia recently in the hospital, some of which have been operated upon, while others are still under treatment; and I propose, therefore, to make this condition the subject of a clinical lecture. I think the consideration of this subject may be useful, first, because the cases I shall bring before you show a variety of conditions preventing the reduction of the hernia; and, secondly, because the treatment of irreducible hernia has of late been much altered and improved. The cases now or recently in the hospital to which I wish to call your attention are eleven in number; and to these I will add two, operated upon in private practice, which illustrate conditions differing somewhat from those of the hospital cases.

I will first give a brief outline of the cases, mentioning only essential points; and will afterwards refer in more detail to the important or interesting conditions which the cases illustrate.

CASE I.—J. D., aged thirty-five. A man with left scrotal hernia of the "congenital" form. The hernia was liable to considerable variations in size and painfulness, part of the contents of the sac were usually reducible, but never the whole. Of late he had been constantly incapacitated for work by severe attacks of pain, associated with increase in the size of the hernia.

An examination on his admission to the hospital showed that the left side of the scrotum contained bowel (which was reducible), nodular omentum (which was irreducible), and some fluid. High up and near the external inguinal ring was the testis. On the left side the scrotum was empty, the testis being entirely undescended. He had never been

able to wear a truss without pain, probably because of the position of the testis.

Operation.—The sac was opened, divided, and ligatured at its neck; the omentum, which was thickened and adherent to the sac, was removed and the vessels ligated; the testis, which was small and wasted, was removed and the cord ligated; the pillars of the ring were laced together. The reduction had been prevented by the adhesions of the omentum to the sac.

Result.—Recovered. No truss worn.

CASE II.—H. H., aged sixty-six. A man with a very large right scrotal hernia, which first troubled him three years ago when he had severe cough. For a year the hernia has been irreducible and slowly increasing in size and painfulness. He has asthma and bronchitis, but is otherwise healthy. The hernia is of large size and very tense. He was kept in a bed, of which the lower end was raised so as to slope towards the shoulders, the scrotum was suspended, and a bag of ice applied at intervals, and he was freely purged. Occasional attempts to reduce the hernia were unsuccessfully made. More than a month of this treatment having produced no effect on the hernia, an operation was decided upon.

Operation.—The sac was opened, and found to contain a large quantity of small intestine, the mesentery of which was greatly thickened, quite hard, and flexible. Large as the inguinal ring was, it had to be still further enlarged to render possible the return of the bowel, owing to the condition of the mesentery. The gut having been reduced the sac was divided and its neck ligated, the pillars of the ring were laced together and the wound closed. Reduction had been prevented by the thickening and inflexibility of the mesentery.

Result.—Recovered. Truss worn as he had severe cough, but there was no protrusion.

CASE III.—G. L., aged fifty-one. A man with large right scrotal hernia of thirty years' duration. No truss worn for the last twenty years, as part of the contents of the sac was always irreducible, increasing in size and painfulness.

Operation.—Sac opened, contained coils of small intestine adherent to each other and to the sac; the sac was dissected off the bowel where adherent, the bowel was returned, the neck of the sac divided and ligated, and the pillars of the ring were laced together.

Reduction had been prevented by the adhesion of the intestine to the sac.

Result.—Recovered. No truss worn.

CASE IV.—M. P., aged thirty-eight. A woman with right inguinal hernia, which had existed since she was fourteen. She had worn trusses, but the hernia often recurred nevertheless; it has been irreducible for fourteen days and is now painful and tender.

She was kept in a bed, of which the foot was raised on blocks, and given spare diet and aperients. Ice was applied to the tumor. After three weeks most of the hernia had gone back, but something remained in the sac which was not reducible.

Operation.—Sac opened, and found to contain only laminated blood-clot like the layers in an aneurism. The clot was detached, the sac removed, its neck ligated, and the pillars of the ring laced together.

Result.—Recovered. No truss worn.

CASE V.—J. S., aged forty-three. A woman with an enormous labial hernia reaching half-way down the thigh and across the middle line. The size and weight of the hernia gave her much distress, which was aggravated by the soreness of the skin produced by friction of the tumor against the thighs. The hernia had existed eight years, and had been irreducible one year. She had worn no truss and the hernia steadily increased in size; during the last year she had had frequent severe attacks of pain, sickness, and constipation. She was kept recumbent, with the foot of the bed raised, given a spare diet, and purged. Ice was applied to the tumor. In three weeks the bowel had all been returned into the abdomen; but there remained a very large ring and an immense pendulous mass of thickened and inflamed skin which had been stretched over the hernia.

Operation.—Sac and redundant skin cut away, neck of sac ligated, and the pillars of the ring laced together.

Reduction had been prevented by the size and weight of the hernia.

Result.—Recovery. A truss was worn, as the abdominal wall was lax.

CASE VI.—J. F., aged forty-two. A man with a ventral hernia the size of a hen's egg between the ensiform cartilage and umbilicus. It had been noticed three months previously in consequence of his having pain in the tumor when stooping, and had always been irreducible. This appeared to be a hernia of subperitoneal fat; it had a distinct impulse on coughing, was irreducible, and was dull to percussion.

Operation.—Tumor exposed, and found to be fat protruding through an opening between the recti muscles. The base of the mass was ligated and the fat removed, the edges of the opening freshened and laced together, and the wound closed with a continuous suture. The

reduction of the mass was prevented by the fat having become spread out after passing through the opening in the abdominal wall.

Result.—Recovery. No truss worn.

CASE VII.—C. W., aged fifty-four. A lady with a femoral hernia the size of a hen's egg, of several years' duration; never quite reducible, so that although she had often tried to wear a truss it could never be tolerated on account of the pain caused by its pressure. The hernia varied in size and had lately become more painful. A portion of the hernia (evidently bowel) could be easily reduced, but there remained in the sac a lump of what appeared to be adherent omentum.

Operation.—Sac opened, no bowel found in it but a nodular mass of adherent omentum, in the folds of which were several cysts containing fluid. The omentum was ligated and cut away, the sac removed and its neck ligated. Reduction had been prevented by the cystic condition of the omentum.

Result.—Recovery. Truss worn.

CASE VIII.—M. A. D., aged eighty-two. A vigorous old woman with an irreducible left femoral hernia of uncertain duration. She had a severe cough, and as she could not wear a truss the hernia frequently increased in size, causing much distress.

Operation.—Sac opened, adherent omentum removed, sac divided, and neck ligated.

Reduction prevented by adhesion of the omentum to the sac.

Result.—Recovery. Truss worn.

CASE IX.—M. M., aged seventy-eight. A woman who had for forty years had an irreducible right femoral hernia, she had not worn a truss. She was admitted with strangulation of the hernia of four days' duration.

Operation.—Sac opened, and within this was found an omental sac greatly thickened and adherent to the margin of the ring, which tightly surrounded the strangulated bowel. The stricture having been divided the bowel was returned, but the recovery of the intestine was sufficiently doubtful to make it seem undesirable to close the sac.

Reduction prevented by adherent omental sac.

Result.—Recovery. Truss worn.

CASE X.—M. T., aged sixty-five. A woman with an irreducible femoral hernia of doubtful duration, lately becoming larger and more painful. Part of hernia (bowel) reducible, but a nodule of omentum remained in the sac.

Operation.—Sac opened, omentum ligated, the divided sac cut away, and the neck ligated.

Reduction prevented by adhesions of the omentum to the sac.

Result.—Recovery.

CASE XI.—T. S., a lady aged about sixty, with a small, irreducible right-sided femoral hernia of a year's duration. No truss could be worn. Lately, the hernia had become very painful and tender, and she had suffered much from constipation and dyspepsia.

Operation.—Sac opened, it contained only omentum, which was twisted spirally and the distal part of it swollen. After untwisting the omentum it was easily returned. The sac was divided and ligated. Reduction was prevented by the twisting and swelling of the omentum.

Result.—Recovery. Truss worn, as the patient was subject to cough.

CASE XII.—G. P., aged fifty-four. This man had been operated upon for strangulated inguinal hernia five years previously, the strangulation had been relieved, but the bowel had not been returned (presumably because of its adhesion to the sac). He wore a suspensory bandage, but was frequently in much discomfort from obstruction of the hernia. He was admitted into the hospital with symptoms of strangulation, but, some portion of the hernia having been reduced by the house-surgeon and the symptoms relieved, he declined further treatment. Shortly afterwards the same thing recurred, and he now desired that an attempt should be made to reduce the bowel by operation.

Operation.—Sac opened and a large quantity of small intestine exposed, the coils of which were firmly adherent to each other and also to the sac. The sac was dissected off its surroundings and cut away, leaving portions attached to the bowel. The adherent coils of intestine were returned into the abdomen with much difficulty. The neck of the sac was tied and the pillars of the ring laced together.

Reduction prevented by adhesions of the coils of intestine.

Result.—Death on fifth day from paralysis of the intestine.

CASE XIII.—N. B., aged twenty-four. A woman with a small, irreducible, painful femoral hernia on the left side, of uncertain duration (probably a few weeks). She was placed in a bed of which the foot was raised, given spare diet and aperients, and ice was applied to the tumor. Under this treatment the tumor diminished in size, but a part remained unreduced at the end of four weeks.

Operation.—Sac opened, omentum found firmly adherent to the neck of the sac and as far as it could be traced within the abdomen. The omentum was, therefore, ligated and cut off, and the sac removed and tied.

Reduction prevented by adherent omentum.

Result.—Recovery. No truss worn.

We will now consider some of the points of interest presented by these cases. An "irreducible" hernia may be defined as a hernia which cannot be completely reduced, but which does not give rise to symptoms of strangulation or obstruction.

You will see that this definition implies that although some of the contents of the abdomen have passed through the hernial opening, and for some reason cannot be returned, yet that the circulation of blood through the protruded viscus is not materially interfered with, from which it follows that the obstacle to the reduction of the hernia is something more than the mere tightness with which it is gripped at the hernial opening.

The symptoms, therefore, are of course very different from those of strangulation, yet you must remember that an irreducible hernia may, and often does, become strangulated. (As in Cases IX. and XII.)

I will briefly contrast the symptoms of the two conditions. In the first place, the patient with irreducible hernia does not present the signs of general distress exhibited by the subject of strangulated hernia, for though there is often some amount of flatulent distention, dyspepsia, and constipation, yet the discomfort is chiefly localized in the tumor and its neighborhood, and is usually not sufficient to prevent ordinary occupation. The patient with strangulated hernia is in great distress and pain.

The tumor in the case of strangulation is tense and tender, in the irreducible condition less tense, and (unless it has been much handled or pressed upon) not at all tender. The impulse from the abdomen is conveyed to the irreducible, not to the strangulated, hernia. In the strangulated condition constipation is usually absolute, in the irreducible form only comparative.

Then,—more important than any other symptom,—when a hernia is strangulated there is *persistent vomiting*; whereas, in the most troublesome irreducible hernia, this does not occur; although it is not uncommon for the patient to be sick at the moment that an additional piece of intestine is protruded. But this I would most strongly impress upon you, that a person who is the subject of irreducible hernia, and who is attacked with persistent vomiting, must be treated as a case of strangulated hernia. It matters not how long the hernia has been only irreducible, it may yet become strangulated and the patient's life endangered; as in Case IX., that of an old woman of seventy-eight, who had had an irreducible hernia for forty years without it troubling her much; she was admitted into the hospital with the bowel so tightly strangulated that a few hours' more constriction would have produced

gangrene, and, as it was, I was somewhat doubtful whether to venture to return the gut.

Case XII. is another example of this occurrence.

The man was frequently incapacitated because of the imminent and sometimes complete strangulation of the bowel, which was at other times simply irreducible. He had actually been operated upon once for strangulation, and on two occasions the symptoms were so severe that he would have been operated upon at once had not the strangulation been otherwise relieved. Such cases furnish a strong argument in favor of the operative treatment of irreducible hernia; for the chief danger of an irreducible hernia is that at any moment it may become strangulated. In most cases no efficient truss can be worn, and so on some exertion a little additional piece of intestine is easily protruded and may become strangulated (as in Case XII.); while in those in which the irreducible contents are only omentum, this omentum often forms a guide along which a portion of bowel escapes (as in Case X.).

Then the local discomforts are often great. The hernia tends to increase in size, and the skin over it becomes inflamed, eczematous, and perhaps ulcerated.

A remarkable example of the size which a neglected hernia may attain was Case V., a labial hernia nearly as large as the patient's head, and extending half-way down the thigh. It materially interfered with the woman's activity, and the skin covering the tumor was inflamed, ulcerated, and painful, and exuded an offensive discharge. In this case, although the hernia had been irreducible for more than a year, the bowel was eventually returned into the abdomen, the sac was then opened and ascertained to be empty, its neck ligatured, and the whole of the pendulous skin together with the sac cut away; the pillars of the ring were then laced together and the skin closed. The woman made an excellent recovery, and there was no protrusion at the inguinal ring, but as her abdominal muscles were very lax, I thought it wise to apply a truss.

It will be seen that in the thirteen cases I have described the irreducibility of the hernia depended upon a great variety of causes; and these we will now consider. The obstacle to reduction is usually to be found in something pertaining to the contents of the sac rather than to anything affecting the sac itself, or the tissues outside of it. Yet occasionally, but rarely, it may depend upon the contraction of the tissues around the abdominal opening, upon thickening of the neck of the sac, or upon hour-glass contraction of the body of the sac. None of these conditions were met with in the cases before you.

The most common obstacle to reduction was some change affecting the omentum, which was found in seven out of the thirteen cases. In three of these the omentum was thickened and its folds adherent, but it was not attached to the sac. In one of these three (Case VII.) several cysts containing clear fluid had been developed among the folds of the omentum, effectually preventing its reduction. In three cases the omentum was adherent to the wall of the sac. In one of these (Case IX.) there was an omental sac into which the bowel had descended. This omental pouch lined the sack proper, and was closely adherent to its neck around the femoral ring. In one case (Case XI.) the omentum was simply twisted and swollen, but could be unfolded, and then was easily returned.

Adhesion and thickening of the omentum, and its attachment to the interior of the sac, usually result from attempts to wear a truss upon unreduced omentum, a most undesirable practice.

A truss so worn is usually a source of pain and is never efficient ; in my opinion, therefore, if the omentum cannot be otherwise returned, operative treatment is demanded.

In one case (Case II.) the reduction of the bowel was prevented by the presence in the mesentery of a large coil of small intestine. A portion of mesentery contained in the sac was converted into a material of almost cartilaginous hardness and was as thick as the palm of the hand, and quite inflexible ; so that it was necessary to enlarge the abdominal opening before reduction could be effected.

In one case (Case VI.) the hernia was of subperitoneal fat, which, having been protruded through an opening between the recti muscles, had become spread out and condensed, and so could not be returned. In two cases (Cases III. and XII.) reduction was prevented by adhesions between the intestine and the sac, and in both of these there were also adhesions of the peritoneal coat of the intestine. In Case III., after the adhesions to the sac had been divided, the bowel was returned without material difficulty ; but in Case XII. a large coil of intestine was firmly and closely adherent, so that even after separating it from the sac it could only be returned *en masse*, after a good deal of difficulty. It was this difficulty, and the paralysis of the bowel resulting from prolonged handling, which led to the fatal result in the case. In one case (Case IV.) the irreducible contents of the sac were found to be laminated blood-clot, but this prevented a truss being efficiently applied, so that the bowel was frequently coming down into the sac and causing trouble.

We now come to the consideration of the *treatment* of irreducible

hernia. A study of the cases related shows most clearly that in twelve out of the thirteen nothing but an operation could have given relief; still there are cases in which a hernia, which has been irreducible even for a considerable period, may be returned by perseverance in the treatment that was successful in Case V. This consists in keeping the patient recumbent upon a mattress sloping towards the shoulders; gentle pressure by an ice-bag or bandage is made on the tumor; at the same time daily purgation and a low diet should be maintained. The cases in which this is likely to succeed are those in which there is only bowel in the sac, and in which no truss has been worn. If the hernia can be thus reduced, the question must then be considered whether a radical cure should be resorted to or a truss worn. The decision of this must depend largely upon the age and condition of the patient, and upon the efficient action of a truss.

But if the hernia cannot be entirely reduced after a reasonable perseverance in such treatment, I have no doubt that an operation should be advised; for the dangers of an irreducible hernia are far greater than any that belong to the operation for its relief. Moreover, in the majority of cases a radical cure can be effected at the same time that the hernia is reduced. The operation which I am in the habit of practising is as follows:

The patient is purged the day before and the lower bowel emptied by an enema on the morning of the operation. Then, the usual antiseptic precautions having been observed, the upper part of the sac is cut down upon and opened. The nature of the contents of the sac and the obstacle to their reduction is then ascertained. Adhesions of the bowel or omentum to the sac are carefully separated, or if very firmly attached to the bowel the sac may be left where so attached, and the rest cut away. Omentum which has become thickened and matted together is best removed, its vessels being, of course, ligated.

The hernia having been reduced, the neck of the sac is pulled well down and separated from the surrounding ring, then a straight needle threaded with a Kangaroo tendon is passed in and out of the neck of the sac so as to carry the ligature round it after the manner of a purse-string. The ligature is tied tightly so that the neck of the sac is drawn together and completely closed. The sac is then divided beyond the ligature and the distal portion of the sac either dissected away or allowed to remain as seems best, while the proximal and ligatured part retracts into the abdomen. If the hernia be inguinal the pillars of the ring are then laced together by a silk or Kangaroo tendon suture commencing at the upper end as a loop, the ends of which cross

each other as they pass alternately through each pillar down to the lower margin of the ring. This having been drawn tightly and tied, the wound is closed with deep and superficial sutures. Various methods of tying the sac have been devised, but I think that which I have described will be found both simple and efficient. It insures the complete closure of the sac, which is drawn together in a plaited or puckered manner which greatly strengthens and thickens this part of the peritoneum, moreover it is a form of ligature which cannot slip. In femoral hernia the sac is ligated in the same manner and the wound closed with deep and superficial sutures. In umbilical hernia, in addition to the ligature of the sac, the edges of the opening are refreshed and laced together.

The patient should be kept recumbent for at least a month after the healing of the wound, after which he may resume his ordinary mode of life. It is important to secure the apposition of the deeper part of the wound, for which it is desirable to use buried sutures, and to forbid the upright posture until the parts have become thoroughly consolidated. If these precautions are observed it is seldom needful to apply a truss. But some of the cases I have related were of an exceptional nature; and the operation was undertaken rather for the purpose of enabling a truss to be efficiently applied than for the production of a radical cure.

AMPUTATION OF THE LEG FOR GANGRENE OF THE FOOT AND ANKLE.

CLINICAL LECTURE DELIVERED AT THE SOUTHERN MEDICAL COLLEGE.

BY J. McFADDEN GASTON, M.D.,

Professor of the Principles and Practice of Surgery in the Southern Medical
College, etc., Atlanta, Georgia.

GENTLEMEN,—This colored man, forty years of age, had his right leg amputated at the tuberosity of the tibia (the point of election) at the last clinic a week ago, and you perceive at present that a union of the wound has taken place throughout by first intention without any sign of suppuration. While the stitches are being removed from the wound we will proceed to give a general history of the case from the outset.

This man suffered six months ago from an injury to the foot, accompanied with an ulceration of the lower part of the foot, which eventually led to a general swelling of the foot and ankle. He presented himself early in July at the Grady Hospital, and was received into the building; but upon examination, it being found that there was a gangrenous process set up in the foot, it was determined not to retain him in the hospital for treatment, and he was, therefore, dismissed.

Subsequent to this time he applied on three different occasions for admission into the hospital, and was refused on account of the presence of gangrene. He then presented himself at the clinic of the Southern Medical College three weeks ago with the foot in the process of disintegration, showing considerable breaking down of tissue, and the *os calcis* already detached and loosened. The gangrenous process had also involved the tissues of the ankle. The foot was dressed antiseptically at this time, after bathing with a solution of permanganate of potassium, and carbolic acid undiluted having been applied to the broken-down surfaces.

Upon appearing at the clinic daily subsequent to this time, anti-

septic dressings were applied, and ultimately the *os calcis* was entirely removed; the great toe, also, and the second toe were detached, being already in a sloughing condition.

Upon a subsequent examination of his condition it was found that the gangrene was progressive without having established a line of demarcation, and it was not thought expedient to amputate until the line of demarcation should be clearly established. Two weeks ago the line of demarcation began to be defined, and a week ago it was found to be well established, so that amputation was determined upon as the only recourse. Inquiry was made at the Grady Hospital as to the practicability of having this patient taken care of in the hospital after the gangrenous limb should have been removed, and it was learned that he could not be received either before or after such an operation.

I accordingly determined to operate upon him, and take charge of the case personally in private quarters; and preparations were accordingly made for performing the operation, with due regard to antiseptic principles, and he was placed under the influence of the A.-C.-E. mixture preparatory to undergoing the operation. In advance, however, of giving the anæsthetic, he had a hypodermic of one-twentieth of a grain of strychnine, and immediately before administering the anæsthetic he was given a hypodermic injection of one-fourth of a grain of morphine and one one-hundred-and-fiftieth of a grain of atropine.

He went under the influence of the anæsthetic readily, and everything proceeded very satisfactorily up to the point of dividing the bone, when he suddenly ceased to breathe, and his pulse became almost imperceptible.

Leaving for the moment a description of the means which were used for his restoration, let me proceed to describe somewhat minutely the technique of the operation itself. A tourniquet was placed in the lower part of the thigh, so as to have the pad resting upon the femoral artery; and, to make assurance doubly sure, an elastic tourniquet was placed loosely around the limb above this, so as to be tightened in case of need.

It was not thought expedient in this case to use the Esmarch bandage for expressing blood from the œdematous limb below the knee, on account of the liability of some of the infected matter from the gangrenous tissue being conveyed into the circulation.

As those of you who are present will remember, the operation was performed by my assistant, Dr. J. McFadden Gaston, Jr., in the following manner: Standing upon the right side of the patient, the long amputating knife was seized in the right hand, carried above and

around the limb at the point which had been previously determined upon for the division of the tissue, and a circular incision was made through the skin. In order to determine the extent of the dissection which would be necessary in turning back this skin to form the flap for the circular operation, a plan was adopted which I think has not been noted in any of our text-books, or, so far as I am aware, has not been practised by any of our operators. Taking the circumference of the limb at the point where it was expected the bone should be sawed off, one-sixth of this circumference was taken as a guide to determine to what extent the flap should be dissected up. It will be noted that the diameter of a circle is one-third of the circumference, and consequently one-sixth of the circumference becomes the radius of the circle, and consequently gives the extent of the flap which would be necessary on either side to cover the end of the wound. This measurement, then, of one-sixth of the circumference being made from the edge of the incision already made around the leg, the flap was dissected up from the subcutaneous tissue and turned back upon the skin above, thus giving an assurance of a sufficient amount of tissue to cover in the stump (muscles and bone) when divided.

The next step was to make a circular incision with the large amputating knife through the muscles and entirely down to the bone. Then the double-edged catlin was thrust between the large and small bones of the leg so as to divide the interosseous tissues, and subsequent to this the small scalpel was used for dissecting around the bone and dividing the periosteum,—the periosteum being entirely divided. In this way the three-tailed retractor came into play for holding back the tissue. We were thus secured against offending either the skin or muscles on the upper part of the incision. The saw was applied and the bones divided,—dividing first the small bone, and afterwards the large bone of the leg,—having an assistant to keep the foot and bone on the lower part of the limb supported so as to obviate any liability of splintering the bone when it was sawed off. The arteries were taken up and secured with chromicised catgut ligatures. The anterior and posterior tibial arteries were the only ones requiring ligation, and when the tourniquet was released the pulsations were perceptibly seen in these vessels adjoining the ligature, but there was no blood escaping except a general oozing from the divided muscles. The skin was now brought back, making an antero-posterior line of union, and a posterior angle formed by uniting these flaps was cut away with curved seissors, so as to give a round finish to the closure of the skin, while the anterior angle was left in a fold to protect the projecting edge of the tibia,

and fitted as a hood over the bone. It will be perceived that this gives a neat closure of the skin over the muscles and bone, and obviates the liability of the point of the tibia coming through the flap, as it might were it not left with the double covering as above described.

The iron-dyed silk ligature was used for closing the flap, leaving, as already stated, a linear union antero-posterior; and no drainage-tube was introduced, as but little exudation of sero-sanguinolent fluid would take place between the ligatures. The wound was washed off, both before and after closing, with a one-per-cent. carbolyzed solution. The line of union was powdered with iodoform, and then the whole stump covered in with iodoform gauze applied thickly around the part. Outside of this cotton was applied, and a roller-bandage securing the whole in its position.

This operation proceeded to its completion without interruption except from the trouble which has already been alluded to in connection with the anæsthetic.

It now becomes proper to advert more especially to the details of the measures resorted to for the restoration of respiration when the patient first ceased to breathe. He was turned from his back to his left side, and again on his back, with pressure applied below the point of the ribs, alternating these movements. Finding that there was still no breathing taking place, the efficient chief of clinic, Mr. Lucius Loften, resorted to artificial respiration by raising the hands and arms of the patient above his head, and bringing them down by his side in regular alternation. In the mean time the head was drawn above the end of the table and allowed to drop back, and the lower jaw held forward by the hands of an assistant grasping the jaw on either side. After repeated efforts by this mode of alternately raising and lowering the arms, and keeping the head in a dependent position, we saw signs of returning life. Up to this time (which seemed several minutes to us who were looking on) there seemed no hope for restoration, and it even seemed at one time that life was extinct; but, eventually, a gasp indicated that there was a vital capacity on the part of the patient, and our efforts with artificial respiration were renewed more vigorously. Finally there were signs of regular respiration, and the pulse-beat began to be restored to its natural condition.

I may say in this connection that it occurred to me as probably influencing favorably the result of the effort made for the restoration of the patient, that the sawing of the bone was done after the suspension of respiration. It has been recently claimed by certain observers that distention of the *sphincter ani* will prove advantageous in re-

storing patients from a condition of suspended animation under anæsthesia. We know too well that operations upon the anus and the distention of the anus under anæsthetics are attended with danger to rely upon this means of obviating fatal results from suspended animation, and I must regard it as one of the unavailing suggestions which have been made by those who have not applied the test of experience as fully as may be.

During the use of these means of restoration, an active use of hypodermics of strychnine and whiskey was resorted to at short intervals, and no doubt contributed materially towards securing the satisfactory results. We are indebted to our assistant, Mr. J. J. Shafer, for attending to this part of the treatment.

This is the first occasion upon which I have had any serious trouble growing out of the use of the A.-C.-E. mixture, and I am quite at a loss to understand why it should have occurred in this case, unless from the general vital depression of the patient in connection with the progress of the gangrene during these later months.

Some have held that the A.-C.-E. mixture is not a reliable preparation on account of the varying volatility of the different elements which enter into its composition. But it has now been satisfactorily established that the three ingredients of alcohol one part, chloroform two parts, and ether three parts, combine with each other in a fixed and definite form, so as to make a solution and not a mixture. Hence it appears that there is no cause for apprehension of a greater or less portion of one or another of the ingredients of this compound being inhaled at any given time, as the entire mixture is uniform in its constitution.

Before dismissing this subject, I wish to draw attention to the important relation of gangrene of the extremities to operative measures. In this case it was thought, by a gentleman whose judgment is entitled to consideration, an impracticable case for operation. But as death was staring the man in the face with the continuance of the gangrenous mass, and he was prepared, and so expressed himself as ready to abide by the consequence, let it be fatal or otherwise, I determined to assume the responsibility of undertaking this operation.

It is well understood that in progressive gangrene an operation upon the leg would not be warranted, but that we should await the final result of the line of demarcation to be established between the dead and the living tissue. In this case, at the line of separation, a thrombus was formed in the arteries at the line of division from the dead tissue, so that there was no possibility for any contaminated

matters being carried into the blood-vessels. The veins also became occluded, and formed as it were a wall of separation between the living and the dead tissue.

The terms "gangrene" and "mortification" are used in almost the same signification, and yet we understand more generally that gangrene may indicate a progressive unfavorable contamination of the part, while mortification indicates the final death of the part. But it should be noted in this case that gangrene has existed to a greater or less extent for several months, and has been very well defined for the past two months, so that the tissues were sloughing and undergoing disintegration during the past month, from the time he came under my observation. There was no prospect of securing any satisfactory result from the local measures which were used, yet this limb was immersed in a strong solution of permanganate of potassium, and an application of carbolic acid was used on the broken-down surfaces with the view of preventing the extension of the contamination, and at the same time he used internal antiseptic and tonic treatment calculated to restore his general system. The Basham mixture of iron was used in connection with chlorate of potassium, and kept up continuously during the time he was under observation preparatory to the amputation, and has been continued since so as to keep up the general tonic and alternative influence of this medication.

It may be stated that no unusual prostration or shock accompanied this operation, apart from the effects which were evidently those of the anæsthetic. There was no undue prostration manifested afterwards. He did not even manifest the usual nausea and vomiting which frequently follow the use of anæsthetics, and less frequently are noted in the use of the A.-C.-E. mixture than with either ether or chloroform.

The temperature fell very slightly below the normal for the first twenty-four hours after the operation. It then resumed its normal condition, and has so continued up to the present time. He has had a good appetite, and performed his functions of micturition and defecation regularly, sleeping and eating regularly also.

It may be stated that the dressing which was applied after the operation has continued upon the wound until removed to-day, and now for the first time the limb has been stripped and we find it united throughout by first intention, and in all respects presenting favorable conditions for prompt healing. All in all, I consider the result of this operation as eminently satisfactory.

It may also be stated, as corollary to the statement made in this case, that in the early observation it was found that maggots had been

developed in the wound in consequence of its being exposed to the fly, by which the larvæ were deposited upon the wound and afterwards developed. These maggots developed in the gangrenous conditions of the parts are rather advantageous than hurtful, as they live upon the decomposed structures, and have a tendency to remove a portion of such disordered tissue.

It may further be stated that the presence of maggots comes in appropriately as an illustration in bacteriology, and the uncertainty as to the connection of bacteria with pathological conditions. In the case of maggots it is well known that the larvæ of the fly are not the cause of the ulceration or gangrene which may exist in connection with the presence of maggots. The gangrenous or ulcerated conditions afford the conditions upon which larvæ of the fly may be developed, and had no connection whatever with the etiological or causative element. The question has been raised, and is *sub judice*, as to the relation of bacteria to disease; and it strikes me that we have in this case a fitting illustration of the probable connection of bacteria with disordered conditions of the organization.

I would say that these maggots were checked in their progress and ultimately destroyed by the free use of a strong solution of chloride of sodium and permanganate of potassium.

In cases where maggots are found in the nose or ear it may be proper to state that nothing acts so promptly in eradicating them as to blow powdered calomel into these parts. Wherever calomel comes in contact with the maggot it causes its death, and is a most radical germicide.

[NOTE.—The patient has been seen lately. This operation was performed September 18, 1895, and now, April 3, 1896, his leg is in good condition and his general health excellent. He is wearing a peg leg made by A. A. Marks, and is able to walk well.]

TYPHLITIS, PERITYPHLITIS, APPENDICITIS, AND PERIAPPENDICITIS.

CLINICAL LECTURE DELIVERED AT THE NECKER HOSPITAL, PARIS.

BY M. CUFFER, M.D.,

Physician to the Necker Hospital, etc., Paris, France.

GENTLEMEN,—It gives me pleasure to present to you a patient who has been under treatment in one of the wards of this hospital to serve as an example of the condition to which I give the name of typhlitis and perityphlitis. Albers de Bonn, in 1836, first applied the term typhlitis to an inflammatory condition of the cæcum. At that time inflammations of the appendix were regarded as of little or no importance, and were considered as the results of inflammation elsewhere. In late years more importance has been attached to this little organ as its morphology and anatomy have been better understood. The term typhlitis and perityphlitis should not be confused therefore with appendicitis and periappendicitis. While this later nomenclature is more exact, some writers go so far as to exaggerate the importance of appendicitis and attempt to disregard all other inflammations in this neighborhood, or at least cast them into the shade. Clinical facts demonstrate that the two conditions exist either combined or separated, and the symptoms of each are quite distinct.

When we consider the anatomy of that cul-de-sac of the larger bowel which is spoken of as the caput coli or cæcum, we can understand at once why it is predisposed by its position to inflammation as the result of the pressure of hardened fæces, while the appendix itself is the seat of inflammation frequently from foreign bodies lodging in it. This blind pouch, opening as it does from the larger bowel and having but a small opening at the point where it becomes continuous with the cæcum, tends to retain foreign bodies which may pass into it. The older writers used to regard this inspissation of the contents of the bowel as the result of atony of the intestinal walls. Where paresis of

the bowel does occur some definite cause for this lesion may usually be found either in the mucous membrane of the intestine, as in dysentery, or as the result of some irritation of the peritoneum in the neighborhood of the cæcum. This latter may be the result of traumatism and paralysis of the cæcum result. Lasque has recorded a number of cases of appendicitis as the result of traumatism from a croquet-ball among players of this game in England. I have myself seen a case of typhlitis in a very fat man who was in the habit of riding constantly in a bent position on a bicycle, a portion of which struck him upon the upper portion of his thigh and side. Atony of the intestine resulted, followed by typhlitis. Again, patients who are the subjects of neurasthenia or depression from fatigue have atony of the digestive tubes and intestines, with dilatation of the stomach associated with constipation. Such patients are frequently the subjects of intestinal paresis in the region of the cæcum.

The presence of hardened fæces in the cæcum tends to interfere with the blood-supply of the mucous membrane of the part and in this way gives rise to lesions. The symptoms of this cæcal atony as the result of progressive accumulation of fæcal matter are shown by a vague sensation of uneasiness in the iliac fossa, which is spoken of as a feeling of weight in the part. Such patients have a tendency to support the loins with their hands, and if you are consulted by them, distention of the cæcum will be at once apparent, the outline of the abdominal enlargement and its position being sufficient to enable you to arrive at a correct diagnosis of the condition. The tumefaction is not painful and transmits to the fingers the sensation that would be given by a block of terra-cotta pipe. One or two doses of a laxative will perhaps settle the question of diagnosis, the tumor disappearing after the administration of these remedies and perhaps all trouble ceasing for the moment, but the cause of the trouble is still in existence, so that treatment must be instituted to prevent a reaccumulation of the fæcal matter. Should this accumulation be allowed to continue unattacked after a variable time, a new stage will develop; in addition to the feeling of distress in the lumbar region, pain will develop which will be increased by any muscular movement of the abdominal walls and readily demonstrated by palpation of the part. The resisting mass in the cæcal region will be especially painful. This condition is associated with a slight rise in temperature. Constipation is now the rule and the stomach swells more and more. The tongue is coated and the appetite gone. Eructations of gases are frequent and nausea and even vomiting are present. Sometimes the symptoms point to

obstruction of the bowel, but the intensity of this symptom varies a great deal.

Occasionally, although the bowels are loaded with inspissated faecal masses, there is a profuse diarrhoea from the descending colon. This condition is known as the "diarrhoea of constipation," brought about by the fact that below the seat of obstruction there is a congestion of the mucous membrane of the intestine resulting in hyperæmia and hypersecretion of the glandular tissue of the parts. As a result of this hyperæmia diarrhoea is produced. In thin subjects it may be possible to demonstrate the presence of inspissated faecal masses in the ascending and transverse colons by palpation through the abdominal walls. In such a case the first indication is to give a laxative or perhaps an enema to unload the bowel, being quite certain that there is no appendicitis associated with the typhlitis. In appendicitis the administration of a purgative is attended with great danger, on account of the possibility of perforation of the inflamed appendix, resulting from violent contractions of the intestines.

The character of the pain is not a valuable guide in establishing the diagnosis between typhlitis and appendicitis. The pain associated with the former condition has more of a continuous character with paroxysmal exacerbations. These colicky pains resemble those felt in hepatic and nephritic colic. The meteorism, the intensity of the pain, its extent, and a tendency to syncope are all out of proportion to the apparent cause, so much so as to lead to the impression that there is general peritonitis present. Then the nervous symptoms are out of all proportion to the extent of the lesion. The nervous phenomena are so pronounced that they have been called by Gubler peritonism. In the subjects of this disease the peripheral nerves seem especially sensitive and excite unusual disturbance of the main trunks.

In arriving at a diagnosis between appendicitis and typhlitis we must resort to palpation, and place most confidence upon the assistance which is rendered by that process. In appendicular colic the maximum of pain will be found at McBurney's point, and this pain will be localized in the right iliac fossa without any tendency to radiate over the abdominal cavity. On the other hand, the pain in typhlitis is accompanied by peritonism, occurs over a much wider area, and is diffuse and abdominal in type. Moreover, in typhlitis we may feel and perhaps even see the caecal tumor. This latter symptom is, however, difficult to demonstrate sometimes on account of the muscular contractions of the abdominal walls.

When the typhlitis has reached a more advanced stage the patient

will present symptoms of a more intense fever, the tongue will be dry, the intestinal obstruction will persist, the pain in the iliac fossa will be most intense, and the general systemic condition much worse. Should a perityphlitis result it may extend in one of two ways,—i.e., either become localized, or infect the peritoneum and produce general peritonitis. If the extension of the inflammation be in a backward direction, the floor of the iliac fossa becomes invaded and an iliac abscess results. If, on the other hand, the inflammation extends forward towards the great peritoneal cavity, adhesions soon form around it and a localized peritonitis results. This latter may end in one of two ways,—i.e., in resolution, or an abscess may result. Such a collection of pus may remain encysted for a time or else open into the peritoneal cavity and cause death rapidly. All such cases should be promptly brought to the surgeon.

As soon as a perityphlitis is well developed the general condition becomes rapidly worse. There is a continuous fever and a typhoid aspect as long as the pus is not evacuated. Ordinarily these inflammatory symptoms do not appear until some time after the cæcal atony has declared itself.

There is a second type of cases where the symptoms may and do declare themselves at once. This form is caused by ulcerations of the cæcum of a nature similar to diphtheritic typhoidal or tubercular ulceration. As soon as these inflammatory deposits produce an ulceration the typhlitis is developed, and presents at once all the symptoms of inflammation of this region.

1. Where this ulceration of the cæcum is the result of typhoid fever the other symptoms of this disease, such as the rose-colored eruption, the long-continued fever, etc., are all present, and give character to the case to which the cæcal symptoms are simply added as a complication.

2. Typhlitis may result from dysentery.

3. Tubercular ulceration may cause this condition and is usually associated with fever, cæcal pain, and diarrhœa. When this condition supervenes upon tuberculosis, the only distinguishing feature of the condition is the presence of tubercular granulations in the adjacent peritoneum.

Appendicitis.—Inflammation of the vermiform appendix may occur without any participation of the cæcum. For convenience two grand divisions of these cases may be made. In the first of these the inflammation starts as an ulceration in the interior of the appendix. In the second group may be placed those cases of appendicitis which are

due to the arrest of some foreign body in that organ. In the latter group the evolution of the diseased condition may be divided into two parts. First, a period when the foreign body becomes held in the appendix, and a second period in which the inflammation develops.

A variety of foreign bodies may give rise to this condition, such as biliary calculi, seeds of all kinds, cherry-stones, and even shot ingested with the parts of birds killed by this means. Of all foreign bodies, however, fecal concretions are certainly the most frequent cause of the trouble.

Among the first symptoms of appendicitis are the so-called appendicular colic and the formation of a sausage-like tumor in the neighborhood of the cæcum. The colic may be intense and preceded by paroxysms of pain with intermittent periods of only slight discomfort. This may or may not be followed by dull heavy pains about the level of the appendix. The temperature may be negative and the pulse present no great peculiarities, so that the diagnosis will at first depend largely upon the seat of pain and upon its general character.

While a number of cases of appendicitis pass on to resolution without any peritoneal symptoms, it is well to be provided for their occurrence. In that form of appendicitis in which the inflammation commences as an ulceration of the mucous lining, localized inflammation of the peritoneum is apt to occur. The appendix in this way becomes surrounded by a false membrane, and if perforation occurs, an accident which is by no means rare, the general peritoneal cavity may be so far protected by this inflammatory barrier that an encysted peritonitis or abscess is alone formed. In other cases, however, the perforation of the appendix takes place before the false membranes have had time to form, and a general peritonitis of an acute form results. Such a condition is difficult to combat even with prompt surgical interference and thorough drainage of the abdominal cavity. Sometimes the extension of the inflammatory condition through the walls of the appendix takes place so gradually and insidiously that almost as soon as the peritonitis declares itself death results before anything can be done.

In the early stages of appendicitis there are a certain number of symptoms which should claim your attention. In the first place, instead of feeling a soft putty-like tumor in the right lumbar region you may find a hard substance which has all the appearance of a cancerous growth, which, taken with the fact that such patients frequently have a cachectic look on account of the gastro-intestinal fermentation, which has been present for some time, tends to confuse the diagnosis.

Frequently, however, in such a case upon questioning the patient you will find that he has had several similar attacks of colic, and after giving him a purgative you will find the supposed cancer disappears.

Another condition with which typhlitis may be confused is nephritic colic, and what favors this error is the fact that, the tissues in the neighborhood of the cæcum being inflamed and painful, the ascending colon is constantly in a state of spasm and gives on palpation a sensation similar to that caused by spasm of a dilated ureter in nephritic colic. It is only necessary to mention such a possible source of error in order to avoid it.

A certain number of patients who are afflicted with hemorrhoids have attacks of a colicky nature that will sometimes extend to the right iliac fossa, and the pain might be mistaken for that which is due to appendicitis. Professor Potain has, however, shown that hemorrhoidal colic has a particular course and direction. Instead of being fixed in the cæcal region it commences in the rectum, passes over the iliac synchondrosis on the left side, to pass around the colon and stop at the ileo-cæcal valve. By properly tracing the course of this pain, therefore, considerable information may be elicited.

During the inflammatory period of appendicitis there will be some confusion in regard to the differential diagnosis between that condition and other febrile states, notably, typhoid fever, because, as is well known, the right iliac fossa may become painful in this condition. If, however, you remember the classical picture of typhoid fever and keep this in mind, there should be no confusion in the diagnosis, as the character of the stools, the enlargement of the spleen, and the rose-colored eruption of typhoid are unmistakable.

In diagnosing a case of typhlitis it is well to remember what the general condition is underlying the local manifestation. The prolonged decomposition and fermentation of food in the paralyzed cæcum bring about certain characteristic phenomena; the complexion becomes earthy-looking, or perhaps jaundiced, the patient becomes emaciated, attacks of heat and cold alternate one with the other, and a febrile condition is lighted up. This is well called a condition of stercoræmia. Again, reflex congestive conditions will arise either in the heart, lungs, or liver, leading one to think that there may have been some primary involvement of these organs. Moreover, it is probable that colonies of microbes start from the cæcum and set up secondary infections, in which they may become localized.

A case which begins as a frank one of appendicitis may, of course, develop into a typical case of typhoid fever, but such cases are rare.

Certain it is that the inflamed cæcum will be a fitting birthplace or culture medium for pathogenic organisms, and we believe that the coli bacillus can, for example, be transformed into the typhoid-producing microbe under favorable conditions. When in the course of some other disease appendicitis may declare itself, it may or may not be recognized, but such a condition has frequently arisen. In this way the diagnosis may be obscured by the appendicular inflammation occurring secondarily. On the other hand, the presence of appendicular colic may clear up a doubtful case. In nine cases out of ten inflammation of the peritoneum is due to rupture of the vermiform appendix, and not to perforation of the cæcum, which is comparatively rare.

CHRONIC POSTERIOR URETHRITIS; CIRCUMCISION.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE.

BY ALBERT MUENCH, Ph.G., M.D.,

Lecturer on Pharmacology, Assistant to the Chair of Materia Medica and Therapeutics, Assistant to the Chair of Genito-Urinary Surgery and Diseases of the Skin in the Kentucky School of Medicine; Consulting Dermatologist to the Louisville City Hospital and the Children's Free Hospital; President of the Falls City Medical Society; Ex-President of the Alumni Association, Louisville College of Pharmacy; Medical Examiner, Pacific Mutual Life Insurance Company; Member of the Louisville Academy of Medicine, Louisville Kentucky.

GENTLEMEN,—The case to which I wish to call your attention is a man, aged forty-two years, who does not come to us on account of a discharge from the meatus, but because he has frequent micturition, passing his water twenty or thirty times a night, and as many times during the day, each time voiding a drachm to an ounce, accompanied by considerable pain. We will have this man urinate into two bottles, and will see quite a difference from the preceding cases. We observe the first urine is very cloudy, and the second also cloudy, but not so much as the first, showing that there is some damage or some pathological condition within the posterior urethra. All the urine that remains in the bladder any time is sure to be cloudy, because the compressor urethræ muscle does not allow the secretion to come forward, and, the internal sphincter having little or no resistant power, the secretions are forced into the bladder, there mixing with the urine and causing the cloudiness. This man says he had "clap" some years ago, which is not surprising to me, as I have had several such cases in private practice in men fifty to sixty-eight years old where the trouble was traced to clap some twenty-five years previous, the patients at the time treating themselves with some of those remarkable "three-day cures." So you see even at that time we had some of those wise men

throwing anything and everything within this delicate structure, using it as a catch-basin for their advertised nostrums. This man says that not long ago his urine was bloody; this is frequently the case, especially where we have painful tenesmus. In these cases the mucous membrane is squeezed by the spasmodic contraction of the sphincter, and a small amount of blood makes its way back into the bladder and colors the urine. These cases of catarrh of the neck of the bladder may be acute or chronic. Both, as a rule, are due to clap, the chronic being due to old lesions which have lasted for some time in the posterior urethra. In the acute form we can flush the inflamed urethra with some antiseptic solution by means of the catheter. We introduce the catheter beyond the compressor urethræ muscle, and allow the solution to pass into the bladder, and if the bladder has the power of expelling all the fluid we allow the patient to pass it himself, if not, we push the catheter back into the bladder, draw off the contents, and wash the bladder with a saturated solution of boric acid until thoroughly cleansed. Sometimes we can regulate this condition by stopping all local treatment, having the patient drink plenty of water, giving the oil of sandal wood, minims x, or salol, grains v, four to six times a day, and a suppository containing one grain of opium each night.

The chronic form needs more heroic treatment, one by which you can deposit the medication in the prostatic portion of the urethra. This may be accomplished by means of an appropriate instrument. The instrument I have is the Keyes' modification of Ultzmann's deep urethral syringe. To use this we have the patient lie flat on his back with the legs separated, the syringe, having previously been anointed with glycerin, is introduced through the meatus into the posterior urethra, and you inject from five to ten minims, according to its strength, of a solution of nitrate of silver. Commencing with five grains to the ounce you can inject ten minims every other day, increasing sometimes to as much as forty grains to the ounce; it is not well to inject more than five minims, and only twice a week. When using this injection it is well to have your patient remain quiet for some little time afterwards, until the burning passes away. The discharge from the posterior urethra going back into the bladder may set up a catarrhal inflammation, which can be relieved after removing the trouble in the posterior urethra by the intravesical injections of boric acid or Thiersch's solution, which is boric acid plus salicylic acid.

We notice that this patient, besides having urethral trouble, has a large prepuce, and it is advisable to relieve him of this superfluous amount of foreskin, not only because he has gonorrhœa, but for pro-

phylactic and hygienic reasons. This large prepuce has considerable to do with the patient contracting different diseases. As you observe the glans penis is surrounded by cheesy matter, which, acting as an irritant, has set up inflammatory lesions, which add to the patient's liability of being infected with syphilis.

As to the question of circumcision: There can be no doubt that it is a valuable procedure, for after having removed this superfluous foreskin, the glans penis may be thoroughly cleansed and will become hardened, and this man will be less likely to contract certain diseases. We know that of two men, one circumcised and with his penis in a healthy condition, hardened by contact with his clothing, etc., another with a large prepuce and herpetic lesions induced by irritation of the smegma,—were the man circumcised to have intercourse with a woman who had either an initial lesion, or a secondary lesion consisting of a mucous patch within the vagina, that he would be less likely to become infected than the man who has a large prepuce with the many avenues of entrance for the syphilitic poison. So that this alone, not considering the many other reasons, would justify us in doing a circumcision, allowing our patient to enjoy cleanliness of his penis as well as of his face. Besides having an enlarged prepuce, we notice there are several small sores upon the outside of the penis which are herpetic in nature. We will remove these while doing our circumcision.

There are a number of popular methods in vogue for removing a superfluous prepuce. Bumstead's method of circumcision is about as reliable as any, and promises equally as good results. I will now go through the regular steps of that operation. We first prepare a fresh solution of cocaine, of a strength of four per cent. I place especial emphasis upon saying a *fresh* solution, because cocaine loses its effect if allowed to remain long in solution. The penis is cleansed, and made thoroughly aseptic, a bandage is placed around its base to prevent the cocaine as far as possible from entering the general circulation; we then carefully outline just where we wish to do our cutting. The corona glandis is usually the landmark; the foreskin should be pulled forward so that the part immediately over the corona glandis is exactly where we wish to cut. If cut at that point we will get good apposition of the mucous membrane, and we need not fear that we shall take off too small an amount nor too much. The bandage having been placed around the base of the penis, we introduce the cocaine: starting at the dorsal portion of the penis, every eighth or quarter of an inch we introduce the needle, continuing around until we reach the starting-point. We must then wait three to five minutes, so that the

cocaine may entirely anesthetize that portion of the penis. Now the circumcision forceps may be applied. There are several such forceps on the market, any one of which is good provided it will engage the prepuce and hold it in the proper position. The only precaution to be exercised, as far as the forceps are concerned, is that you do not get them too tight nor too loose. If too loose, the prepuce will slip, and you will miss your outline; if too tight, sloughing will be induced. Having adjusted the forceps with curved circumcision scissors the superfluous amount of prepuce is removed, after which the forceps should be taken off; then make a dorsal incision into the mucous membrane running back far enough to leave about one-quarter of an inch of mucous membrane to be stitched to the skin.

As to suture material: You may use either catgut, silk, or wire. I usually employ silk. Getting the parts in direct apposition, we place first a stitch on the dorsal part of the penis, another at the frænum, then two lateral stitches, filling in wherever it is necessary, sometimes using eight or ten sutures. After finishing the stitching, it is advisable to cut the bandage at the base of the penis. This should be done gradually, so that if any cocaine enters the general circulation it will be allowed to do so gradually, and so that the flow of blood will wash out as much cocaine as possible. We then allow two or three minutes to elapse to see whether any great amount of hemorrhage will ensue. It is seldom that we have any serious hemorrhage due to circumcision, because it can be controlled by pressure. Putting a piece of gauze around the penis and tightly compressing it for a few minutes, you will observe that almost all hemorrhage has ceased.

As to the dressing that shall be applied after doing a circumcision: This is about as important as the operation itself. We should endeavor to make the patient as comfortable as possible. First, after the penis has been thoroughly cleansed and dried, some antiseptic powder should be used. Dermatol is about as useful as anything. Iodoform is very good, but in the majority of cases it cannot be used, as the disagreeable odor will suggest to the patient's friends that something more than a circumcision has taken place. Dermatol, chemically known as subgallate of bismuth, or boric acid, may be used. A small bandage of bichloride gauze is tightly placed immediately over the incision, another over this, and so on until eight or ten bandages have been wrapped around the penis thoroughly covering it from the external world. A bandage is placed around the waist of the patient, a towel is pinned in the back and brought between the legs, so that the penis is brought up directly against the abdomen, and a piece of cotton placed over it, then

the towel is pinned in front, forming what is known as a "jockstrap." This jockstrap after circumcision allows the patient to go around perfectly freely. The stitches are allowed to remain in, if you use silk, from three to four days, when after taking off the bandages the stitches are removed and the penis again dressed with antiseptic powder, or a wet dressing may now be used, but the powder is more comfortable to the patient, and in from eight to ten days a perfect result will be obtained, the patient remaining away from his business only the time required for the operation, which altogether is about a half-hour. Pain due to the operation is usually very slight. Taking these facts into consideration I cannot see why a man will continue uncircumcised, the glans penis covered with cheesy matter, which continually gives him trouble, to say nothing about the odor, when relief can be obtained by so simple an operation.

FEMORAL HERNIA; FRACTURE OF THE NECK OF THE RIGHT FEMUR.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL.

BY ARTHUR DEAN BEVAN, M.D.,

Professor of Anatomy in Rush Medical College; Professor of Surgery in the
Woman's Medical School; Surgeon to St. Luke's, the Presbyterian, and St.
Elizabeth's Hospitals, Chicago.

GENTLEMEN,—The patient upon whom I shall operate to-day is a woman, forty-two years of age, who gives the following history: Ten years ago, following some heavy lifting, she noticed a rupture upon the left side, which proved to be a femoral hernia. Within a year a rupture developed on the opposite side in the same position. These have gradually increased in size until the one upon the right side is, as you see, as large as a child's head at term, the one upon the left the size of a man's fist. She has never worn a truss. The condition has become so serious as to prevent her from doing work of any kind. There has never been a history of strangulation on either side, and she comes to us for the purpose of having a radical operation performed for the relief of this condition.

The operation which I shall perform upon her is one which was given to the profession in 1894 by Bassini, of Padua, and is known as the Bassini operation for the radical cure of femoral hernia. You know Bassini invented the operation for the radical cure of inguinal hernia which to-day receives the sanction of the majority of surgeons. His operation for the radical cure of inguinal hernia better meets the indications, both anatomical and surgical, than any operation which has so far been introduced. I believe that the same can be said of his new operation for the relief of femoral hernia; that it also meets better than any operation which has thus far been devised the anatomical indications of restoring to the normal the boundaries of the femoral canal.

Now that the patient is fully anæsthetized and thoroughly prepared

for an aseptic operation, we begin with an incision over the centre of the tumor and parallel with Poupart's ligament. This incision (in this case of huge femoral hernia) is about six inches in length. We divide the skin and superficial fascia, and in doing this, as you notice, divide some of the branches of the femoral artery and femoral vein which require the application of artery forceps. These branches are the superficial epigastric and the superficial external pudic vessels. We come now down to the cribriform fascia, which we divide, and find that we are upon the thin sac of the hernia. This sac presents itself here as a single layer of tissue, but we know that anatomically it is composed of the septum crurale, the femoral sheath, and the peritoneum, but from the long existence of the hernia the layers have become amalgamated into one. Dividing this single layer of tissue we open into the peritoneal covering of the sac and expose its contents. We can see that these are the appendix, the cæcum, and ascending colon, which are readily recognized from the peculiarity of their structure, and we find also this very much thickened omentum. We shall ligate and remove this omentum as we do now, ligating it by a chain of medium-sized catgut ligatures. Pushing the stump back into the abdominal cavity we can now, as you see, reduce the cæcum, colon, and appendix. The next step of the operation will be the dissecting out (freely from the surrounding tissue) of the sac of the hernia. This is accomplished by the handle of the knife and the finger and the division of an occasional firm fibrous attachment with the scissors. Freeing the sac high up in the femoral canal to a point as high as the internal opening of the canal, we now ligate it with a strong piece of catgut and amputate the redundant portion about half an inch below the point of ligature. The stump of the sac is now pressed back into the abdominal cavity. We have accomplished the first step required in the operation for the radical cure of hernia,—i.e., we have removed the pathological sac.

The second step necessary is the closure of the abnormal opening. In closing the abnormal opening we shall follow distinctly the method advocated by Bassini. The steps of this method consist in first closing the internal opening of the femoral canal, the femoral ring, and, secondly, closing the calibre of the canal itself. We close the internal opening of the femoral canal by passing four or five sutures through Poupart's ligament above and the pubic portion of the fascia lata below, bringing Poupart's ligament down to the fascia lata and the pectineus muscle. Care should be taken in passing these sutures to avoid injury of the femoral vein, which is at the outer border of the femoral ring, and in passing these sutures we should pass them first

through Poupart's ligament, beginning internally with our first stitch and taking up a large section of this fibrous structure. The needle should then be passed through the pubic portion of the fascia lata and deep in the substance of the pectineus muscle. The stitches are now tied and the internal opening is closed. You will notice that the four sutures in this case are in a line parallel with Poupart's ligament. The femoral canal itself, which is the open space between the femoral ring and the saphenous opening, is now closed with a series of sutures placed in the direction of the long axis of the leg. The first is placed just above the saphenous vein, through the iliac portion of the fascia lata externally, and through the pubic portion of the fascia lata internally. The second is placed a half inch above this in the same way, and, as you see, it requires in this case five sutures so placed to close completely the femoral canal. I have employed in the closure of this opening kangaroo tendon. Well-prepared catgut meets the indication equally well. The external incision is now closed with silkworm retention sutures, placed half an inch from the margins of the incision, and the skin should be carefully approximated by a fine continuous catgut suture. The wound is dressed with iodoform collodion and a large aseptic gauze dressing covered with absorbent cotton, held in place by a spica bandage.

We shall now operate upon the other side, and we find the contents of the sac to be principally small intestine, which we free, replace, then ligate the sac and close the opening as before. You will notice that we do not employ drainage upon either side. This patient will be kept in bed for twenty days, and will then, if no complications arise and an aseptic wound-healing is obtained, be allowed to get up and about with a compress and spica bandage. These will be discarded at the end of a month, and we will expect a permanent and radical cure.

The prognosis in this case is favorable, but you must constantly keep in mind this fact, that in making a prognosis in operations for the radical cure of hernia you should divide the cases into two groups. The ordinary herniæ not larger than a fist and presenting no complications, such as strangulation, inflammation, or adhesions between the sac and its contents, form one class of cases, which are simple and in which we should expect practically no mortality. The other class is represented by the case which we have before us to-day. In cases of huge herniæ, of the size of a child's head, in double herniæ of large size, and in herniæ presenting complications, such as strangulation, inflammation, or adhesions, the mortality following operations forms a

considerable per cent. ; the prognosis, therefore, should be guarded, and the surgeon should not enter lightly upon the performance of such an operation, nor belittle its dangers to the patient, because such cases do present as great a mortality as complicated ovariectomies. In fact, they are to be regarded as extensive laparotomies. I say, however, that in this case the prognosis is favorable because we have not met with any serious complications during this operation. The general condition of the patient is good ; there is no organic lesion of the heart, of the lungs, or of the kidneys, and we are, therefore, warranted in expecting a favorable result.

This is the first femoral operation following the Bassini method which I have performed or seen performed. Bassini made his report of this operation only last year, after having performed some fifty operations without any mortality and without any failures. As far as he could follow the cases all resulted in a radical cure.

The second case which I shall present gives the following history : Five months ago this man, forty-five years of age, fell a distance of twenty feet and fractured the neck of the right femur. The case was treated with extension. At the end of two months the patient was allowed to get up on crutches ; he did not obtain much use of the limb, and four months after the accident pain and swelling developed about the hip-joint, followed later by an abscess which opened both above and below Poupart's ligament. As you see, there is a single sinus above Poupart's ligament, and there are two on the anterior and outer aspect of the thigh below the great trochanter. Upon introducing a probe into the sinus above Poupart's ligament, I find that it passes into the pelvic cavity, and at a depth of five inches comes in contact with uncovered and probably necrotic bone. I cannot determine the exact portion of the pelvis involved.

I shall now make an incision parallel with Poupart's ligament, open up this sinus extensively, and examine with my finger to determine the extent of the diseased bone and try to ascertain its exact anatomical position. I find with my finger a movable sequestrum deeply situated below the ilio-pectineal line. I cannot with my finger readily remove this sequestrum. It is of large size. It has in close contact with it the external iliac artery and vein, and it is evidently in contact with the lateral wall and upper surface of the bladder. I cannot use much force in lifting this sequestrum out of the pelvis for fear of rupturing these vessels. I carefully with the finger and a blunt periosteotome push the vessels to one side, free the sequestrum, and, as you see, with a pair of large bone-forceps gradually and carefully draw the mass out

of the cavity. This is evidently the head and a portion of the neck of the femur. There is no question of this fact when you see the large globular head covered with cartilage, which is eroded in many places, and at this point there is the depression for the ligamentum teres. Introducing my finger again into the cavity, I find nothing but granulation tissue, no opening through the acetabulum. The history of the case is now clear to us. At the time of the injury the neck of the femur was fractured, the head and neck driven through the acetabulum into the pelvic cavity. The opening in the acetabulum has been closed by the formation of new bone, and the head and neck have remained in the pelvic cavity as a loose sequestrum. At first no infection occurred in the tissues about this bony fragment. Later—four months or more after the accident—the irritation of the foreign body lowered the vitality of the tissues with which it was in contact to such an extent that they became a *locus minoris resistentiæ*. Pus microbes reached this point either from the circulation or passing through the rectal walls; infection and abscess resulted. This is a very unusual case. I have never seen one like it, nor am I familiar with a similar case in the literature of the subject. I believe that the removal of this necrotic bone will be followed by the closure of this cavity and sinuses leading from it, and that the patient will ultimately make a recovery with a fairly useful limb, with limited motion in the newly-formed hip-joint, or possibly complete ankylosis.

SURGICAL TECHNIQUE.

CLINICAL LECTURE DELIVERED AT ST. LUKE'S HOSPITAL, DENVER, COLORADO.

BY CLAYTON PARKHILL, M.D., DENVER, COLORADO,

**Professor of the Principles and Practice of Surgery and of Clinical Surgery in the
Medical Department of the University of Colorado.**

GENTLEMEN,—I fancy that it will be conceded that the difference between the surgery of twenty years ago and the surgery of to-day is in the matter of technique. The older surgeons were, doubtless, quite as skilful operators as those of the present day, yet their results were not as good. Their wounds became infected, and their patients suffered all the dangers of prolonged suppuration,—septicæmia, pyæmia, gangrene, erysipelas, etc. The technique of the modern surgeon destroys the disease-germs when present, and prevents their entrance after the wound has been closed, thus saving the patient from much danger and suffering. It is an easy matter to roll the sonorous terms, asepsis and antisepsis, over the tongue, and to say that all the precautions have been taken in a certain operation, when, as a matter of fact, the technique has been anything but perfect. In other words, I consider it an extremely difficult matter to present a technique which is beyond criticism.

I have asked you to come up here to see an abdominal section, not that I expected to show you anything new or novel in the operation for the removal of diseased ovaries and tubes, but that I might exhibit to you the technique which I follow in this hospital. I will pass over the medical preparation, and deal only with the surgical aspect. The preparation for the operation was begun yesterday afternoon, at which time the pubes were shaved and the entire abdomen thoroughly scrubbed with soap and water. It was then scrubbed with a one to one-thousand acid solution of bichloride of mercury, after which, towels wrung out of this solution were bound upon the abdomen, and left until this time. While the patient is being anæsthetized let us criticise the preparation of all things which are expected to come into contact with her in the operation. The instruments were

boiled for ten minutes in a solution of bicarbonate of sodium under pressure, after which they were transferred to the basins and placed in a sterile normal salt solution.

We use, for sutures and ligatures, silkworm gut, silk, and catgut. The silkworm gut is usually boiled with the instruments. The silk is sterilized by boiling in pure water, as the soda solution impairs its strength. The catgut is washed in ether, and kept immersed in ether for twenty-four hours. It is then placed in a solution of one to one-thousand bichloride of mercury in alcohol, and in this is sterilized by boiling. Any one of these may be needed in each abdominal case; consequently, they are all prepared. The dressings, sponges (always gauze sponges), sheets, and towels have all been sterilized in an Arnold steam sterilizer. In a case which is not already infected we use only what is known as the normal salt solution,—that is, a solution of chloride of sodium in water, having a strength of six-tenths of one per cent. This we sterilize by the fractional method, in flasks having a capacity of one gallon. There has been until recently, however, a break in the technique when it came to getting the solution out of the flask,—the mouth of the flask was not sterile. I have devised a circular alcohol lamp, which I show you here, which, when placed around the mouth of the flask, discharges a flame in every direction towards the centre. This direct heat sterilizes the lips of the flask, and burns away the top of the cotton. When that has been done, you may be sure that there will be no contamination of the fluid as it is discharged.

My assistant and myself prepare ourselves in the following manner. You will observe that I say assistant, because more than one assistant in the ordinary abdominal section is superfluous, and the greater the number of hands coming in contact with the patient, or any of the appliances used in the operation, the greater will be the danger of infection. We have operating suits made of some material which will wash. After each operation they are laundried, and placed in a solution of one to one-thousand of bichloride of mercury, after which they are rough dried. They are then rolled inside-out by a nurse with sterile hands, and placed in a sterile receptacle until needed at the time of operation. We begin the preparation of our hands by scrubbing the nails, subungual spaces, and finger-tips with soap and a good bristle brush. When the nails have been thoroughly softened and cleansed by the process, they are dried, and with a sharp knife are pared and scraped, both underneath and above, until they are free from any foreign material or dead tissue. We then return to the soap and brush, and the nails, hands, and forearms to the elbow are thoroughly

scrubbed for a period of about ten minutes. They are then immersed in a solution of one to one-thousand bichloride, and kept there for a period of one to three minutes. After that the bichloride solution is washed away so that none of the mercurial may by any possibility enter the abdominal cavity.

The patient now being under the anæsthetic, my assistant will prepare the abdomen after the nurse has removed the dressings applied yesterday. It is scrubbed with soap and water and a stiff brush. You might ask me, What is the necessity for this repetition of scrubbing? My theory is that the application of the moist antiseptic towels for twenty-four hours softens the superficial layer of the epidermis, so that the scrubbing completely removes it. It has been shown in bacteriological laboratories that germs lie underneath the superficial epithelium. The abdomen is now washed with a bichloride solution of one to one-thousand, and afterwards with normal salt solution in order to remove any trace of the bichloride which might remain.

I have put my instruments in two basins, and these have been placed on two arms of the instrument-holder, which is attached to the table opposite to the patient's hip.

In one basin are the sutures and ligatures with the instruments which will be needed in connection with them, and in the other basin the instruments which I will need in the operation. In the third basin are placed the sponges, and this basin is located on another arm of the instrument-holder. I devised this instrument-holder several years ago. It has three movable arms, arranged in such a way that my instruments are always before my eyes, and nobody touches them but myself. The sutures and ligatures are managed by the operating-room nurse, who stands just to my right on the opposite side of the table and can see precisely what I want. The sponges are placed convenient to my assistant's hands as he stands on the opposite side of the table. This device, I believe, reduces to a minimum the handling of instruments, sutures, ligatures, and sponges.

While my assistant is repeating the scrubbing of his hands, I will surround the area of the operation with sterilized towels. All being ready, we will now begin the operation. Our first incision carries us through the skin, the superficial fascia, and the muscles. It is not only unnecessary, in my opinion, but it is bad practice to dissect up layer by layer, seeking for the linea alba; I go through all the structures with a clean incision, whether it strikes the linea alba or not. We now pick up the transversalis fascia with two pairs of forceps and divide it. We next pick up the peritoneum and open it in the same

manner with scissors, and prolong the incision in the peritoneum and transversalis fascia to correspond with the external incision. The right ovary, you will observe, is cystic and utterly worthless so far as any function is concerned. We will ligate it with its corresponding tube and remove it. The left ovary, as you see, is also diseased, so we will remove that. I have used silk ligatures and touched the stumps with a Paquelin cautery. You will observe that we surround the handle of the cautery with a sterilized sponge while we are using it. I have seen operators ruin their technique by taking hold of a cautery-handle, which is never sterile. We now pass the sponge into the cul-de-sac of Douglas and find there has been no bleeding. It is entirely unnecessary and inadvisable to irrigate an abdomen after such an operation.

We will now close the wound with silkworm-gut sutures, which will include all the layers of the abdominal wall. Except in very stout persons I never suture the wall by layers. In my opinion, many more cases of ventral hernia occur because the sutures are removed too early than because the wall is not sutured layer by layer. These sutures will not be removed until the eleventh or twelfth day.

We will now apply the usual dressing of gauze and cotton, held in place by adhesive strips and a many-tailed bandage, and send the patient to bed. The operation, as you will observe, has been completed in eight minutes. Time is a most important element in most operations and particularly in abdominal cases. No haste should be used, yet the operation should be completed as quickly as is consistent with care.

A case of right inguinal hernia was operated upon by the Halstead method to still further illustrate this technique.

[NOTE.—Both of these patients made excellent recoveries, the wounds being dressed but once, and that on the eleventh day.]

FIVE CASES OF SECONDARY SYPHILIS.

CLINICAL LECTURE DELIVERED AT THE LOUISVILLE CITY HOSPITAL.

BY LOUIS FRANK, M.D.,

Associate Professor of Obstetrics and Director in the Bacteriological Laboratory in the Kentucky School of Medicine; Gynæcologist to the Louisville City Hospital and the Kentucky School of Medicine Hospital, etc., Louisville, Kentucky.

GENTLEMEN,—We will examine this morning five cases of specific trouble, and make a few remarks concerning the diagnosis and treatment of such cases in general. These five patients are females from the colored ward, and all present secondary manifestations of syphilis, as will at once be observed. They have all applied at the hospital for treatment within the last two or three months.

CASE I.—The first patient is twenty-six years of age, and has been in the hospital only a few days. The secondary eruption has just appeared upon her chest and over the abdomen, and, as you will see, is quite characteristic. Some of the individual spots have a close resemblance to psoriasis, but by a closer examination we find the eruption is typical; you see there are distinct papular syphilides, like little shot, just beneath the skin.

By the closest inquiry we are able to elicit no history of the primary infection; she claims never to have had a sore on any part of her body, so far as she knows. This brings up an important question. The primary lesion in the female, I believe, may often be so slight as to be easily overlooked. Again, it may be in some part of the genital tract so nearly inaccessible as to make its detection practically out of the question. The sore may be far back in the vagina; on the cervix; it may be just within the external os, hidden, and so slight as to cause little or no inconvenience, and even if searched for, might be overlooked. Of course, in the male the same difficulty does not exist.

One feature in the case before us I have not yet mentioned. This patient has had within the last few days quite a severe sore throat, and by examining her mouth and throat to-day we find several mucous

patches. In making a diagnosis of syphilis, an examination of the mouth and throat is of the greatest importance, because we sometimes discover the initial lesion on the tonsil, the gums, or elsewhere about the mouth, lips, or throat. The appearance of the primary lesion in this situation may lead us to suspect sexual intercourse *per orem*, but this is very often not the case, as the sore may occur from other causes. Extra-genital chancre occurs not infrequently, and the most prolific cause is regarded as kissing or biting. I know of one case in which the initial lesion was unquestionably due to infection from a cigar. Cigarmakers have a habit of moistening the tip of the cigar with saliva to make it stick, and if suffering with a chancre or syphilitic lesion about the lips or buccal cavity at that time, it is easy to understand how the disease might be communicated in this manner. The same rule would hold good if a chancre existed on the finger; the latter, however, is extremely rare. Only a few cases of chancre about the hands or fingers have been recorded. In the case I have referred to, the history obtained I know to be absolutely reliable, and there can be no question about the infection having come from the cigar.

CASE II.—The next patient we will examine is twenty years old, and has a lesion which is entirely different from Case I. The eruption is very extensive. There are a few papules, but the majority of the eruption seems to be in the nature of an exanthema. The eruption seems to have become dry, and is scaling. The outbreak extends over the arms, especially their posterior surface, and may be observed over almost the entire surface of the body. In white races such an extensive eruption presents an entirely different appearance.

By a further investigation we find this patient has a rhinitis, also some trouble with her eyes, both of which affections are of specific origin. Examining her throat we observe that she has two or three patches about the upper portion of the tonsil, which may also be regarded as secondary manifestations. She says that three or four weeks after intercourse there appeared a small sore on the genitals, the eruption following in six weeks after the initial lesion. Usually secondary symptoms appear in from six to seven weeks after the primary lesion.

CASE III.—This patient, while somewhat younger than the preceding two, presents symptoms which the others have not. She has had an eruption extending very generally over the entire surface of the body, which has now practically disappeared, only a few spots remaining. Her history is about the same as detailed in Case II.,—viz., the appearance of a primary sore a few weeks after intercourse, following this the eruption which we have mentioned.

We now come to the feature which is totally different from the cases we have shown. She has several decidedly enlarged glands about the neck, which are undoubtedly syphilitic manifestations. Glandular symptoms are of some importance in making a diagnosis of syphilis, and some authorities have even gone so far as to say that their occurrence in suspected cases is positive evidence. Again, others claim that syphilis may occur without any glandular enlargement whatsoever. Those glands most frequently enlarged are about the neck. Great stress is laid, especially by Sigmund, upon enlargement of the epitrochlear glands, it being claimed that this is a positive sign. The glandular symptoms appear usually about the time of the appearance of the secondary rash.

CASE IV.—This girl is but sixteen years of age, and while she presents unmistakable symptoms of secondary syphilis, claims never to have had a primary sore. By the closest questioning we are able to elicit no history of even the smallest primary lesion upon any part of the body. She has had what she terms sore throat, and the secondary symptoms, in fact, have appeared almost entirely in the throat; there is only a slight eruption, but by a careful examination we find a few maculæ, which are syphilitic.

The interesting point about the case is the absence of any history of a primary lesion, which further illustrates the fact that in the female it may often be so slight as to escape detection both by the patient and the physician. From the symptoms present we can unhesitatingly pronounce the trouble secondary syphilis, although we are able to discover no evidence of the initial lesion. She has improved under specific treatment alone, thus confirming the diagnosis.

CASE V.—The last patient in the series is twenty-three years old, and entered the hospital one month ago. You will observe she has numerous enlarged glands, involving both sides of the neck. One or two of these glands have broken down and have been curetted. She gave absolutely no history of syphilis, and I could make out nothing at the first examination except some slight bronchial trouble, and an increased amount of dulness at the root of the right lung. I examined the sputum, also the curetted material from one of the glands, but found no tubercle bacilli.

The diagnosis in this case is questionable. There is no history of a primary lesion, and close inspection of the genitals reveals no cicatrix, which we would expect to discover if a primary sore had existed there. Remembering, however, that in women the primary lesion in many cases cannot be found, and remembering, also, the habits and proclivi-

ties of people of this class, we must always have syphilis in our minds as being an important factor in the production of various troubles. In this case the absence of the tubercle bacillus would indicate that tuberculosis is not responsible for the enlarged glands, etc. There may be a syphilitic nodule of the lung, or we may have involvement of the lung of tubercular origin, each going through stages of ulceration which appear similar from external examination.

Enlarged glands of the neck most frequently occur as a result of tubercular infection, and we are usually able to discover the tubercle bacillus in the scrapings after curetting such glands. But we also find, as stated in speaking of Case III., that the glands of the neck also become enlarged in syphilis. As I have indicated, its significance is questioned by some, but there is no doubt that they are affected; not only the cervical lymphatics, but we also find enlarged glands in other spaces, as those in the jugular space, the femoral glands, and also the inguinal glands; in the latter place not only as a result of primary infection, but as a secondary lesion. Enlarged glands due to syphilis are, as a rule, to be distinguished from those enlarged as a result of tuberculosis, from the fact that they are smooth and are not so prone to become agglutinated or to undergo suppuration and break down. This is one reason why I believe the case before us may be one of tubercular infection.

It has been suggested by some authorities that we attempt to dissect out these enlarged glands in their entirety when of tubercular origin, the idea being that the gland may be entirely removed, thus getting rid of this source of infection. It is, however, almost impossible to dissect them out without rupturing the capsule of the gland, giving rise to just as much trouble or even greater infection of the wound than by opening, this being especially true after suppuration has occurred, so that the best plan is simply to open these glands and curette them, scraping out as much as we can.

I question very much whether the case before us is really syphilitic in origin. I am inclined to believe, notwithstanding the absence of the tubercle bacillus, from the conditions present, that the trouble is of a tubercular character, especially in view of the fact that we know people of her color, a mixture of white and black, are very prone to tuberculosis. She has been put upon a tonic treatment since entering the hospital, and there has been considerable improvement in her general health.

As to the treatment of the other cases shown,—they have received mercury by internal administration and also by inunction. Mercury given by the mouth is regarded as a specific in syphilis by most syphil-

ographers, but in my experience I have found that inunction is the best plan of treatment that we have; this has given better results than mercury by the mouth, or the mixed treatment of mercury and iodide of potassium. In the foregoing I refer only to the secondary manifestations. In the tertiary stage, where we have tumors, gummatous growths, etc., we may use large doses of the iodide of potassium with marked benefit. I remember last year, during my service here, we had a case of tertiary syphilis, where there were gummata involving the brain, causing double vision, incomplete loss of vision, loss of control of the sphincter muscles, both of the bladder and bowels; the patient lay in bed moaning constantly, and was in a pitiable condition. We placed her upon large doses of iodide of potassium; she took six drachms three times a day. We gave no mercury. She improved rapidly and was shortly able to go out. Since her discharge from the hospital she has married. I saw her about eight months ago, some of her old symptoms having returned. I again placed her upon iodide of potassium, two drachms three times a day, resulting in prompt improvement. She had at one time quite a decided hemiplegia due to pressure by the gummatous tumors.

Of course, in the treatment of syphilis we must be careful in the administration of iodide of potassium not to push it to an extent which will produce marked iodism. We should begin with small doses and gradually increase the quantity, watching the symptoms closely. Some patients seem to possess a peculiar idiosyncrasy, so that it is impossible for them to take even the smallest quantity of iodide of potassium without producing the most disagreeable symptoms, such as discharge from the nose and eyes, coryza, etc. In some cases it produces a distinct eruption all over the body. I have in mind now one patient that cannot take even five grains of the iodide of potassium without there appearing upon the body a decided eruption, pustular in nature. When the iodide is withdrawn the eruption gradually disappears.

Treatment by inunction of mercury is employed very largely in Europe, and is coming into use in this country, not so many, however, using it here as abroad. We find it not so extensively employed in France and England; in other countries on the Continent mercurial ointment is the favorite remedy.

The so-called mixed treatment, which for a long time has been so popular, is the French treatment. This consists of iodide of potassium and the bichloride of mercury given together, in the proportion of from five to ten grains of the former and from one-sixteenth to one-twentieth of a grain of the latter.

Another method of treatment which is popular with some is the hypodermic injection of mercury or of calomel. Mercury is also mixed with salicylic acid and injected into the tissues, the salicylic acid being used to promote absorption. This has been considered by some of our most eminent authorities as an excellent plan of treatment, especially where patients are unable to take mercury by the mouth. However, as before intimated, in my own experience the inunction plan has been followed by the best results. This method is to take one to one and one-half grammes of mercurial ointment, which is rubbed into the legs at night; the second night the same quantity is rubbed into the thighs; the third night in the forearms; the fourth night in the arms; the fifth night over the chest and over the ribs; the sixth night over the abdomen, which will take up a week's time. Then let the patient take a thorough bath, and the next week follow out the same routine. At the end of the second week another bath should be taken, and so on. This treatment should be continued for a period of six months, if no symptoms indicating too much mercury appear. If symptoms of pytalism develop the mercury must be reduced. At the end of six months there should be a period of rest for about the same length of time, then the treatment should be reinstituted as before, followed by another period of rest. If this treatment is given for three years and no symptoms develop, we may safely pronounce the patient cured.

Of course the treatment will have to be varied to a certain extent according to the symptoms present. Most authorities recommend that no active treatment be instituted during the primary stage, but we should wait until the development of secondary symptoms. There may always be some doubt about the correctness of our diagnosis, and we should give our patient the benefit of the doubt. We cannot well tell our patients that the trouble is syphilis and put them upon proper treatment until we are absolutely certain of our diagnosis, as, if we were mistaken, the patient would always have doubts about the correctness of our statements. The best way to do—and few now do not follow this course—is, after the initial lesion has appeared, to administer some slight local treatment, drying powder, etc., and wait until secondary symptoms have appeared, verifying the diagnosis.

TWO CASES OF PRIMARY NEPHRECTOMY IN WOUNDS OF THE KIDNEY.

CLINICAL LECTURE DELIVERED AT THE CITY HOSPITAL, ST. LOUIS, MISSOURI,
BEFORE THE SENIOR CLASS OF THE MARION-SIMS COLLEGE OF MEDICINE.

BY A. C. BERNAYS, A.M., M.D. (Heidelberg), M.R.C.S. (Eng.),

Professor of Anatomy and Clinical Surgery at the Marion-Sims College of Medicine,
St. Louis, Mo.; Life Member of the German Society of Surgeons;
Secretary, Surgical Section Tenth International Congress,
Berlin, etc.

GENTLEMEN,—I have the opportunity of presenting to you to-day two cases upon which I have performed the operation of nephrectomy. Since the first operation of nephrectomy was performed, by my beloved teacher Gustav Simon, in 1868, at Heidelberg, the removal of the kidney by the surgeon has been performed about five hundred times, and of that number I can find only five cases recorded in which the operation was done primarily for a bullet wound lacerating the organ. The mortality of the operation is a very favorable one, except in cases of malignant tumors involving the kidney. The propriety of primary nephrectomy in cases of laceration and rupture of the kidney, whether the result of a contusion or of a gunshot wound, has been affirmed and denied. I recommend the immediate removal of a lacerated kidney in preference to its removal after the patient has been subjected to the grave dangers of suppuration, sepsis, and uræmic poisoning, one or more of which must of necessity accompany the expectant plan of treatment. This recommendation refers of course only to cases in which the injury to the organ is of such a character that it must cause the death of the whole or of a great part of the organ. In order to determine the degree of injury to the organ an explorative incision will be necessary. This will permit the operator to adopt such a course as may be indicated. In some instances mere drainage by means of the gauze pack will suffice; in others partial nephrectomy will be indicated; in still others total nephrectomy must be done. In those cases in which the expectant treatment has been adopted recoveries

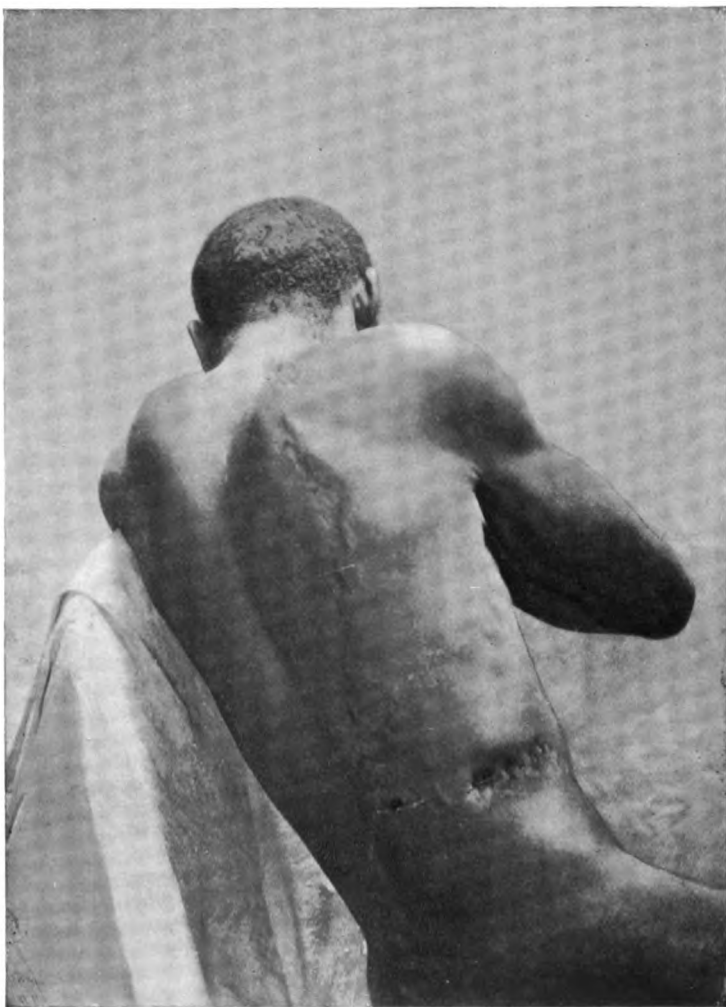
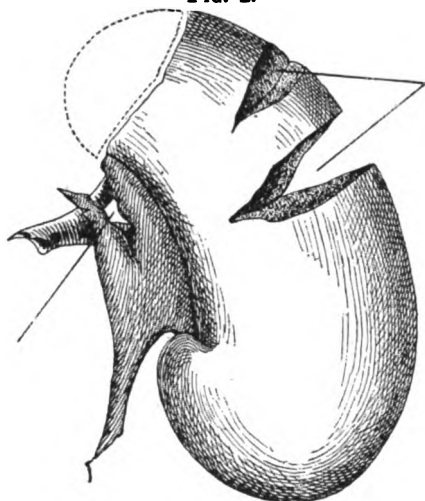


FIG. 1.—Scar of the incision made to remove the kidney in Case I. The photograph was taken forty days after the injury. The point of entrance of the bullet is seen near the posterior end of the wound.

sometimes take place even when the whole organ becomes necrotic, and the patient passes through a most dangerous and weakening septic infection. At the expiration of from three to six weeks after the accident, the operation of "nephrectomy" will amount to little more than the opening of a lumbar abscess, and the discharge of the necrotic tissue which will be found more or less completely isolated within an abscess cavity. In these cases the point of incision is usually indicated by a fluctuating, more or less bulging, or even pointing swelling in the lumbar region.

The first case is that of a colored man (Fig. 1), forty-two years of age, who was shot Wednesday evening. The bullet entered the right

FIG. 2.



Kidney removed from Case I. The upper part of the organ was missing, but is indicated by dotted lines. The torn off ureter is seen, as also the torn stump of the artery. A lacerated flap of the pelvis is seen overlying the artery. The vein was torn off so near the hilus that the stump cannot be shown in the drawing.

lumbar region about one and a half inches from the spine and just below the twelfth rib. It passed in an almost straight direction towards the median line. The bullet can be felt subcutaneously in the region of the gall-bladder, about two and a half inches from the median line and about the same distance from the lower margin of the ribs. I saw the patient about an hour after the accident. A catheter was introduced into the bladder and a great quantity of bloody urine was obtained. No dulness on percussion could be found in the region of the liver nor of the kidney beyond the normal area. The patient is well nourished, perfectly conscious, but is suffering a great deal of pain

in the right side of his abdomen. The pulse is 68, the respirations are 44, and the temperature is $101\frac{4}{10}^{\circ}$ F. The skin is warm and moist.

The direction of the wound through the upper part of the abdomen made it clear that the kidney must have been perforated near its hilus, and that the liver also must have been perforated. A large quantity of blood in the urine proved that active hemorrhage was going on, and the repeated introduction of the catheter, at intervals of ten minutes, each time finds the bladder full of almost pure blood. After the patient had been properly prepared and chloroformed I made an incision about eight inches in length transversely over the right lumbar region. This incision began at the lateral margin of the erector spinæ muscle and extended forward parallel to the twelfth rib and one-half inch below it. After cutting through the quadratus lumborum muscle the perirenal fat was exposed and bulged into the wound. An enormous amount of clotted blood was found, and it was seen that the bullet had passed through the kidney, tearing its pelvis, the ureter, and the renal vein. The kidney was removed, together with its fibrous capsule, the pedicle being tied with a single ligature. Another incision, about five inches long, was then made longitudinally over the bullet, parallel to the lateral margin of the rectus abdominis muscle. After the abdominal cavity was opened it was found that the gall-bladder and the intestines were intact, but the bullet had torn the anterior edge of the liver just to the right of the gall-bladder. This wound was bleeding freely, and after the clots of blood were removed, it was packed with iodoform gauze and the strips allowed to protrude through the upper edge of the incision. The lower three inches of the incision were closed by sutures. The patient stood the operation very well; there was no shock. The first day the patient was allowed about half an ounce of ice-water every three hours. He was to be given an enema of a half pint of water every two hours if thirsty. Nothing else was given by the mouth until the third day, and he was nourished by enemata of milk. No morphine was given to relieve pain. The patient has made an uninterrupted recovery. On the eighth day the gauze was removed from the anterior incision, which soon closed with but little suppuration. The posterior wound healed by first intention, with the exception of a little superficial granulation. The patient is now ready to be discharged, sixty days after the operation. Fig. 1 is from a photograph of the patient taken in the hospital twenty days before his dismissal.

The second patient which I show you is John Burns, twenty-three years of age. He was riding on the driver's seat of a cab and fell from

the seat, striking the hind wheel with his right side in such a manner that the whole weight of the body came upon the region of the short ribs, pressing them against the tire. He then fell to the granite pavement and received some contusions of the head. The patient was taken to the City Hospital immediately after the accident. I was called about twenty-four hours afterwards, and found that he had acute alcoholism. I learned that he had suffered severe pain during the night, which at times became very intense and which still existed in the right side of his abdomen. His bowels were open, and he had vomited two or three times during the day. Any movement of the body gave him considerable pain, and on that account he remained in the recumbent position. It was stated that he had passed his urine when he first entered the hospital, and that no blood was found in it. The pain was so great that a quarter of a grain of morphine was given hypodermically, and half an hour later he was resting easier and a more accurate examination was made. Percussion gave dulness on the right side in the lumbar region, and also in the abdomen below the liver. This dulness did not disappear on shifting his position. Pressure over the same region gave severe pain, while pressure over the remaining portions of the abdomen did not. His respirations were not very rapid, pulse was fairly regular and about 110 per minute, temperature 100°. His urine was drawn off and found to contain a large quantity of blood. There were about three hundred cubic centimetres, and the blood was not clotted, but was thoroughly diffused throughout the urine. A half an hour after the bladder had been emptied by the catheter, the catheter was reintroduced, and again about two hundred cubic centimetres of nearly pure liquid blood were drawn. The bladder was then inflated with air, and it was found to be intact, and when the catheter was passed this air was expelled through it. Dr. H. H. Born, the senior assistant of the hospital, suggested this method of detecting or excluding rupture of the bladder. The diagnosis of a rupture of the right kidney with a large hæmatoma in the lumbar region was thus made.

The abdomen and back were then thoroughly cleansed, shaved, and scrubbed with bichloride of mercury and the patient chloroformed. Drs. H. H. Born, Heine Marks, John Stack, H. T. Crossen, E. A. Noonan, and R. E. Wilson assisted me in this operation, and have attended to the after-treatment. An incision about five inches long parallel to the lower border of the chest about an inch below the twelfth rib over the site of the dulness was made. When the perirenal fat was reached a large hæmatoma presented itself. The hæma-

toma occupied the retro-peritoneal space and extended down to the ilium. It was larger than a child's head. The clots and the liquid blood were turned out. The kidney was next seized by the hand, and, to my great astonishment, seemed to be almost loose in the large cavity made by the hæmatoma. It was brought into the wound and was actually in continuity with the body only by a small shred of tissue made up principally of the torn ureter. The renal artery was found to be torn off and, *mirabile dictu*, there was no arterial hemorrhage, in fact no bleeding at all. The kidney was badly torn, the upper half being broken into several pieces, the laceration extending into the pelvis of the kidney. The ureter, which formed the only connection between the kidney and the body, was ligated and the kidney then removed. The wound was thoroughly irrigated with sublimate solution and packed with gauze. The incision was closed to more than half its original length with deep silk sutures, antiseptic dressings applied, and the patient put to bed. His pulse was fairly good, and his condition appeared to be favorable, the operation having lasted altogether about thirty minutes. Patient rested fairly well during the first night, became nauseated and vomited once, pulse ran up to 125, temperature 100°. The patient could not urinate spontaneously, but the urine was drawn by means of a catheter. For the two following days the patient was unable to urinate and could be relieved only by means of a catheter. The urine remained bloody for the first few days. The reaction was alkaline, the spectrum of hæmoglobin was well marked, and there was a trace of albumen, total quantity one thousand seven hundred and seventy-five cubic centimetres, specific gravity 1022. On the second day the total quantity was one thousand five hundred and sixty-one cubic centimetres, and the following day nine hundred and sixty cubic centimetres. On the fourth day the urine became clear, the blood having entirely disappeared. The patient made a prompt recovery. The wound has healed by primary union, with the exception of a small canal which you see here through which it was drained. The patient is now ready to be discharged, having been in the hospital altogether fifty days.

In conclusion, gentlemen, let me advise you always to make the transverse incision, as you see it in these two cases. The advantages of this incision over the old longitudinal one are very great. I have removed tumors weighing as high as fifteen pounds through this incision, and I think it is sufficient for all purposes in the vast majority of cases. In some very large tumors a longitudinal may have to be added to the transverse incision. The latter is much easier to make,

and it does not produce so deep a wound as the longitudinal incision. The edges of the wound have a natural tendency to gape, which is not true of the longitudinal incision. The peritoneal cavity need never be opened in operations which attack the kidney from behind, and though we do not fear the opening of this serous cavity, it is better to leave it closed, if for no other reason than to prevent its being soiled by the possible entrance of blood or urine.

In the first case which I have shown you there could be no doubt about the necessity of an exploratory operation, because of the rapid loss of blood which came from the torn renal vein, and it was also absolutely necessary to determine whether the intestines or the gall-bladder had been injured or not. In the second case the operation was indicated by the rapidly-growing hæmatoma and the loss of blood. In this case the nephrectomy was done about twenty-four hours after the accident, and this case is remarkable principally on account of the very unusual, perhaps unique, observation of a kidney torn loose from its pedicle in such a manner that its removal was accomplished without ligating the renal artery. It sounds almost incredible to say that a kidney can be removed without ligating a vessel. The artery evidently was torn in such a manner that its coats retracted irregularly, and that a firm coagulum was formed in the twisted and lacerated stump of the vessel. The great pain which this patient suffered was no doubt due to the enormous distention of the capsule formed by the perirenal fat and subperitoneal connective tissue. The blood which escaped at the time of the rupture was confined in this space, and may have aided the process of hæmostasis. I have an indistinct recollection of having read of a similar case somewhere in surgical literature, but have been unable to discover the report. This observation is one of the most interesting that I have ever made in my surgical experience. The specimen of this kidney which I shall pass around shows that the cupola is missing. One of the attendants found the missing piece in the mass of coagula which had been turned out.

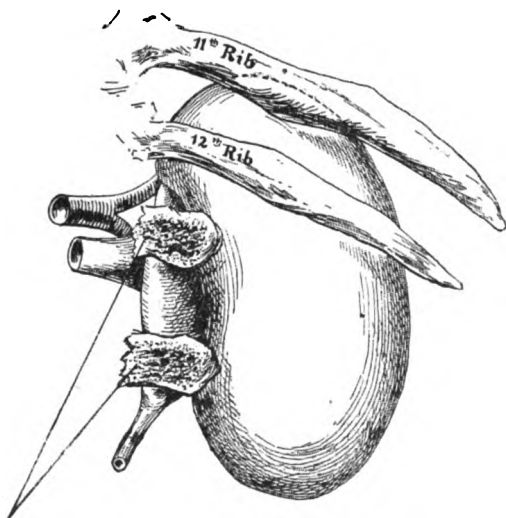
The case has given me much to think about, and particularly the mechanism of the traumatism, which resulted in the almost complete tearing loose of the kidney at its hilus, which at first seemed almost inexplicable.

I shall pass around a drawing showing you the exact anatomical relations existing between the kidney and those bony structures with which it might possibly come in contact. Fig. 3 is a drawing which I have made after a dissection, and it is intended to give a diagrammatic representation of the parts concerned in this injury. By comparing

Fig. 3 with the specimen (Fig. 2) it at once becomes apparent that this injury, which at first was so dumfounding, can be entirely explained on the basis of the anatomical relations.

In the first place, it seems plausible that the cupola of the kidney was cut off by the lower margin of the eleventh rib, and the other lacerations were made by the twelfth rib. The tear in the expanded superior pelvis of the ureter and also the laceration of the blood-vessels near the hilus must have been caused by the crushing and tearing of the transverse process of the first lumbar vertebra against the kidney,

FIG. 3.



Relations of the normal kidney to the last ribs and the transverse processes of the first and second lumbar vertebrae. (After a dissection made by Professor Bernays.)

which was being pressed and rolled backward and upward with great force by the tire of the wheel. The diaphragm, which lies between the ribs and the kidney, was no doubt considerably bruised, and, indeed, the patient complains of some pain on the right side even now when I ask him to draw a deep breath.

Taken altogether, then, this case is not only interesting and, perhaps, unique, but we have been much instructed in some ways, and, just like the first case, it is most satisfactory in its result both to the patient and to the attending and visiting surgeons.

THE OPERATIVE TREATMENT OF APPENDICITIS IN CHILDREN.

CLINICAL LECTURE DELIVERED AT THE CHILDREN'S HOSPITAL, PARIS.

BY PROFESSOR GRANCHER, M.D.,

Clinical Professor of Diseases of Children in the Paris Faculty of Medicine, France.

GENTLEMEN,—During your medical career you will frequently be called upon to decide a very delicate and important question,—namely, whether operative measures should be resorted to in children suffering from appendicitis, and at what moment the operation should be performed. This is, I repeat, an extremely delicate question, and the most practical way of helping you to solve it is, it appears to me, to bring before you two children at present in the wards of this hospital, and to describe certain other cases of the same affection. You will thus be better able to judge whether or not surgical intervention is called for. Let us now begin with the patients.

Here is a child, eight years old, of whom I have already spoken to you when referring to appendicitis in general. He is now completely cured, or, at least, has the appearance of being so. He complains of nothing, and no longer suffers from pain; the appetite is good, the intestinal functions are normal, and, undoubtedly, his family, as well as his physician, consider that he is entirely cured. The little patient likewise believes himself to be perfectly well. Thus, all appears to be right, and yet, upon gentle though deep palpation in the direction of a line extending from the upper anterior iliac spine to the umbilicus, you will feel a long and somewhat hard cord, pressure upon which causes slight pain. The location of this region of tenderness was first pointed out by an American surgeon, McBurney, and therefore bears his name. Here, then, is a child whom, apparently, one would be justified in regarding as absolutely cured, who, nevertheless, presents tenderness upon pressure at a given point, which indicates that there exists a certain degree of inflammation of the appendix.

The second child is thirteen years old, and his family history is excellent. His parents and their three children are all well, nor is there anything to be noted with regard to his personal history. He was born at full term, and was nourished at the breast. Six months ago he suddenly complained of a very severe pain in the right iliac fossa. This pain has continued more or less ever since.

On examining the abdomen a small hard mass can be felt in the right iliac fossa; and upon a level with McBurney's point a hard and somewhat lengthy cord is felt. There is no constipation. The urine is normal, and the patient walks with difficulty. The affection is, therefore, an appendicitis which has followed an almost uninterrupted course of six months. Upon being questioned as to whether he wishes to be operated upon, he says that he has suffered so much and for so long a time that he would be glad to undergo an operation, if he could be relieved of his pain.

Now, should he be operated upon?

I have already indicated what an embarrassing question this is. The day after the lecture given you upon the subject of appendicitis, I had a conversation with several young surgeons upon this point. They were all of the opinion that it was advisable to operate under almost all circumstances, basing their opinions upon the theoretic reason that in all cases where the diagnosis has been established, surgical interference should be seriously considered.

This, as you know, is the formula of the modern surgical school, which, for my part, I do not find a good one. My objections, which I will give you later on, were refuted, and they considered that it was not advisable to wait until the operation was proposed by the parents, but rather to insist upon their consenting to it. The responsibility, moreover, rests upon the physician under this view of the question; and it therefore becomes necessary for us to recognize the condition early and act promptly.

Before laying before you the objections I made to the views advanced by these gentlemen, I would like to call your attention for a few moments to a case in which death occurred after surgical intervention, but will first mention another very interesting case, that of a child operated upon this morning. Last September this child was attacked by intestinal inflammation with persistent diarrhoea for a period of six weeks. Last Wednesday, when the child came home from school, it complained of a very severe pain in the right iliac fossa and vomited several times. This sudden onset, without apparent cause, is one of the characteristic signs of appendicitis. The vomiting continued until

Friday, when a purgative was administered. The habit of giving a purgative at the beginning of appendicitis is bad, and I beg of you not to resort to it. Place the child in bed, give laudanum, put ice upon its abdomen, insist upon a restricted diet, and wait. I agree with Dr. Routier who, in a work recently published, decries the giving of purgatives. The child in question was, however, purged, and as the condition did not improve, he was brought to the hospital. An examination disclosed a hard mass in the right iliac fossa, the temperature was 100.4° F. This morning it was still higher, and we decided to operate as once. The operation was performed by Dr. Brun, who found a sac containing fetid pus. This sac, I may add in passing, had been diagnosed before the operation, which is not always the case. The sac was dissected out with the fingers, and the appendix was resected near the cæcum. Here is the appendix, and you will see that it presents a perforation at its summit and that its walls are considerably thickened. I should not be at all surprised if it showed tubercular lesions, but in order to be certain of this a microscopical examination would have to be made. In any case the operation was indispensable, and was justified by the presence of pus. The child will most probably recover. We now return to the case before mentioned, in which surgical interference was less successful, the child having died. You may examine the appendix and you will see that it seems to be normal, the walls are thin and but slightly inflamed. A perforation exists which caused the purulent peritonitis which resulted in the death of the patient, notwithstanding the operation. The affection began acutely with vomiting. The pain, which at first was general, became localized in the right iliac fossa with high fever. The next day a purgative was administered, and on the day following a physician was called in, who diagnosed appendicitis. The child was taken to the hospital on the succeeding day, at which time the face was livid, the temperature was 96.6° F., and the pain severe. That same evening, upon opening the abdominal cavity, thin pus, having a fecal odor, was discovered. The appendix was resected, and the peritoneum flushed with boiled water, and a double suture of the peritoneum and the skin was made. The condition became, nevertheless, more and more aggravated, vomiting set in, and the child succumbed in a few hours.

Such a case impresses one with the great dangers which beset this condition. Experience teaches, however, that recurrent appendicitis is less serious than the first attack. Consequently we may say that recurrent appendicitis becomes less dangerous to life with each attack, like the two children you saw at the beginning of this lecture, provided, of

course, that the inflammation is localized and does not become general. But who can be sure that this will be the case? for at any moment the local peritonitis may become general, and carry off the patient. It is, indeed, impossible to solve this problem, and it is for this reason that surgeons always advise an immediate operation. I shall now cite another case in which surgical intervention proved ineffectual.

The patient was a boy nine years old. Upon his arrival at the hospital an abdominal tumor of considerable size was found in the median line. The limits of this tumor could be absolutely defined upon palpation with one or both hands. Distention of the bladder or the existence of a prevesical phlegmon was suspected. Ice was placed upon the abdomen, and the next day the child was seen by Dr. de Saint Germain, who diagnosed an appendicular phlegmon, and advised surgical interference. Several days later the patient experienced severe pain in the right iliac fossa, the temperature rose, and it was decided that an operation should be performed by Dr. Brun. A considerable accumulation of pus was evacuated, but no fistula or tuberculous lesion was found. In the evening the child suddenly died. The autopsy showed that the appendix was lost in the purulent sac and that it was perforated. Through this perforation the pus infected the peritoneal cavity, giving rise to a fatal purulent peritonitis.

By what rule shall our conduct be regulated when in the presence of a child attacked by appendicitis? If you are merely a general practitioner, and have to call in a surgeon to perform the operation, limit yourself at first to therapeutic measures. Prescribe absolute rest, give opium, regulate the diet, and wait. Keep a careful watch, and at the slightest alarm be ready to attack promptly. It is for this reason that I always advise you to have a surgeon in consultation.

You have just seen that an operation does not always succeed, but it must be resorted to nevertheless. When you are dealing with a first attack, never wait more than twenty-four hours.

Certain surgeons advise immediate operation in order to avoid *in extremis* operations, which are always performed under the worst conditions, as you can readily understand. The cases in which the disease develops very rapidly, or in which the general condition is very precarious, are not the most difficult to treat; there are others in which our embarrassment is much greater.

What should be our procedure with regard to the two children I presented to you? The one considers himself cured, and, nevertheless, shows traces of an unsubdued inflammation; the other is at the critical period. Both have recurrent or relapsing appendicitis. According to

some authorities both should be operated upon. This is a delicate question to decide, from the fact that recurrent typhlitis is frequently of a tuberculous nature. Surgeons will tell you that it is not for tuberculosis, but for the peritonitis with its attendant serious and often fatal complication, that they operate. The tuberculosis may or may not be cured,—that is another question. The essential point is to save the patient from an affection which constitutes a perpetual menace to his life.

Remember that I have already told you that tuberculosis of the appendix and of the cæcum occurs frequently, and that it occupies almost the first place as a starting-point for this disease after that of the lungs, but that it can often be cured. Consequently, after all that I have told you, you must hold to the following conclusion,—and I would wish to impress it upon your memory: every case of appendicitis requires, if not an operation, at least a surgical consultation. It is, indeed, either a question of a first attack, in which case the danger is very great, or it is a recurrent appendicitis, for which surgeons advise operation between the attacks,—that is to say, an operation during a period of quiescence in order to avoid possible future accidents.

As for the two children, they should be operated upon. In the first case the parents should be sent for, and the situation explained to them in order that they may understand that, notwithstanding the apparent recovery, their child is still ill and in constant danger. The operation performed now, when the general condition is not serious, is a simple one; the statistics give a mortality of two per cent., thus proving that it is not a dangerous operation. In the case of the second child no hesitation is possible. He has been suffering continuously during six months, and it is our duty to relieve him of a diseased and troublesome appendix. Dr. Brun will examine him and perform the operation shortly. The little patient himself desires it, and the parents do not make any serious objection. All are agreed upon surgical intervention. We may still question whether the affection is not a tuberculous one. I cannot tell, and, in my opinion, it is impossible to know with absolute certainty. I deliberately set aside this question, since I wish to cure him, not of a possible tuberculosis, but of a localized peritonitis, which may some day become generalized and cause death.

Gynæcology and Obstetrics.

CANCER OF THE CERVIX UTERI.

LECTURE DELIVERED AT THE UNIVERSITY OF PENNSYLVANIA.

BY CHARLES B. PENROSE, M.D., Ph.D.,

Professor of Gynæcology in the University of Pennsylvania.

GENTLEMEN,—Cancer of the cervix uteri is a very common disease. About one-third of all cases of cancer in women affect the uterus. Like cancer in other parts of the body, the disease has been observed at almost every period of life except infancy. It occurs most frequently during the active mature life of the woman between the ages of thirty and fifty. It is probable that more cases occur during the latter decade of this period than during the former.

Cancer of the cervix is a disease of the childbearing woman. It is very rare in women who have never conceived. Statistics show that the average number of children which have been borne by women suffering with cancer of the cervix is five. The stout, well-nourished mother of a large family is very prone to cancer of the cervix.

It is probable that the chief predisposing cause of cancer of the cervix is a fissure or laceration which has resulted from a miscarriage or labor. A focus of irritation—a point of diminished resistance—is thus developed, where cancer may start in one predisposed to this disease.

In some of the cases in which cancer of the cervix occurred in sterile women it has been found that previous operative traumatism had been inflicted by dilatation or incision.

Cancer of the cervix uteri originates in one of the following structures :

1. The squamous epithelium covering the vaginal aspect of the cervix.
2. The cylindrical cells lining the cervical canal.
3. The epithelial cells of the cervical glands.

The early appearance of the disease, the gross form assumed by the cancer, the direction of growth, and the clinical course depend upon the place of origin. In the later stages of the disease characterized by extensive destruction of tissue all forms appear alike.

1. Cancer of the vaginal aspect of the cervix very often begins in a benign erosion of an old laceration. The early stage of transition from the benign to the malignant condition is not apparent to the unaided senses and can be recognized only by the microscope. Later a superficial ulceration is developed, or the cancer may assume the polypoid or vegetating form, and becomes readily recognized by the unaided senses. It will be remembered that true ulceration as a benign condition is very rare on the cervix uteri. The erosion of a laceration is in no sense an ulceration. An ulcer of the cervix, therefore, should always excite the gravest suspicions. The polypoid or vegetating growths vary very much in size. They are sometimes very exuberant, forming large cauliflower-like masses, filling the upper part of the vagina. In other cases they are small warty growths or rounded protuberances about the size of a pea. The disease usually spreads to the mucous membrane of the vagina. Less often it extends to the cervical canal and to the body of the uterus.

2. When the cancer begins in the mucous membrane of the cervical canal extensive destruction of tissue may take place before any appearance of the disease is observed at the external os. In some cases the whole of the cervix is destroyed, leaving only a shell, the lower portion of which is the vaginal aspect of the cervix.

When the cervix is lacerated and the mucous membrane of the canal is exposed, the disease is more early apparent, and we may then observe the malignant ulceration of the exposed mucous membrane, or the presence on it of cancerous outgrowths.

This form of cancer of the cervix uteri is more likely to extend upward to the endometrium than is the form first described.

3. When the cancer begins in the distal ends of the cervical glands it may appear as a nodule in the body of the cervix. It will be remembered that sometimes these glands become distended peripherally, so that they appear beneath the mucous membrane of the vaginal aspect of the cervix as Nabothian cysts. In a similar way, when the glands become seats of cancerous infection, hard nodules of various size may appear or be felt beneath the vaginal mucous membrane.

In other cases the nodule is situated beneath the mucous membrane of the cervical canal. These nodules disintegrate and perforate the overlying mucous membrane, and form in this way a malignant ulcer,

which may appear either in the cervical canal or on the vaginal aspect of the cervix.

As has been said, when extensive ulceration and destruction take place in the last stages of the disease, all the varieties of cancer present a similar appearance and are accompanied by similar symptoms.

Cancer of the cervix uteri may extend to the vagina, to the body of the uterus, to the broad ligaments, the bladder, rectum, uterus, and the peritoneum, and it may be carried by the lymphatic vessels to the pelvic and inguinal lymphatic glands.

In nearly all cases of long standing the upper part of the vagina is involved. Sometimes the whole of the vaginal canal is infiltrated with cancerous growths from the cervix to the vulva.

The body of the uterus always becomes involved sooner or later. This is most apt to occur in that variety of the disease which begins in the cervical canal. The endometrium is affected by direct extension, and the malignant disease is often preceded by some benign form of endometritis.

Sometimes the cervix becomes very much hypertrophied by general infiltration to three or four times its normal size.

The broad ligaments are very usually involved by direct extension of the disease. They become thick, hard, and very rigid, holding the uterus fixed in the pelvis. When only one ligament is affected, the uterus is drawn to that side. The ureters become involved by extension of the infiltration to their walls, or by pressure upon them by the thickened broad ligaments.

The bladder, on account of its close relationship to the cervix, is always involved in the last stages. The disease may extend to the vesical mucous membrane, and symptoms of cystitis will appear. Sometimes the vesico-vaginal septum is destroyed and a urinary fistula results. Extension to the rectum is not so common. As the disease extends upward the peritoneum may be perforated, though this is an unusual accident. In most cases peritoneal involvement is preceded by local inflammation and adhesions which prevent direct penetration of the peritoneal cavity.

The pelvic and the retroperitoneal lymphatic glands become affected in the later stages of cancer of the cervix. The inguinal glands are rarely involved in the later stages of the disease. Metastasis to remote parts of the body is unusual. Cancer of the cervix usually remains localized and does not become metastatic.

From this description it will be observed that in the early stages of cancer of the cervix the disease presents a variety of appearances. As

cure of the disease depends upon its early recognition, it is of the utmost importance that the physician should be familiar with these early phenomena. When cancer begins in an erosion of a laceration, we find that the eroded surface bleeds more easily than in the non-malignant condition. It is somewhat more elevated above the surrounding surface of the cervix. We may detect by palpation a more or less indurated edge around the erosion, and this is not felt around a benign erosion. The submucous structures of the cervix may feel brawny and indurated. If the erosion has become an ulcer, the indurated edges and the involvement of the deeper structures of the cervix are more marked. It must always be remembered that an ulcer of the cervix is very rare as a benign condition.

In the vegetating form of cancer of the cervix we may find small warty growths, or a large cauliflower-like mass, or rounded or irregular protuberances growing from the surface of the cervix. There is here also felt an induration around the base of the growth and throughout the cervix.

A very striking characteristic of cancerous growths of the cervix uteri is their friability. The warty growths or cauliflower-like masses break off readily upon even gentle palpation, and profuse bleeding often results. There is no other disease of the cervix in which the outgrowths are of such a friable and vascular character. Even in the ulcerated form of cancer the edges of the ulcer are of this same friable character. When the disease begins immediately within the external os this opening becomes enlarged, the cervical canal destroyed, and the appearance is presented of a deep, conical excavation, with ulcerated, unhealthy edges in the centre of the vaginal cervix. When the disease begins still higher up, the cervical canal may be the seat of extensive destruction of tissue before any lesion is visible below the external os. Usually, however, the os is sufficiently open to permit the condition of the canal above to be seen.

When the disease begins in the racemose glands of the cervix, the nodules may be felt beneath the mucous membrane of the vaginal aspect of the cervix. The whole cervix is usually indurated and somewhat enlarged. The mucous membrane overlying the nodule may appear congested, and upon palpation it is found that the overlying mucous membrane does not glide readily over the nodule, but seems to be adherent more than normal to the underlying structures.

In all the forms of cancer of the cervix there is present, to a greater or less extent, a general induration of the cervix. The elasticity or resiliency of the cervix is also diminished or lost, and this

is shown not only by the sensation upon palpation, but by the fact that the cervix is not capable of dilatation by sponge tent, or otherwise, as in the normal condition.

In the last stages of the disease the gross appearance is the same in all forms of cancer of the cervix. The cervix may fill the whole vaginal vault, sometimes hypertrophied to the size of the adult fist. The presenting mass is ulcerated, gangrenous, covered with friable vegetations bathed in thin fetid pus and blood. The vaginal vault is itself usually involved by extension of the disease. The body of the uterus is found to be enlarged, and the mass of the cervix is held rigidly in the pelvis by the thickened cancerous broad ligaments.

In some cases, instead of a protruding mass, we discover an immense crater in the vaginal vault, a crater, with indurated edges and sides, which is surmounted by the body of the uterus. The size of the crater shows that the destruction of tissue has extended far beyond the normal limits of the vaginal and supravaginal cervixes. The interior of the crater presents an ulcerated sloughing surface.

There is no condition which should be mistaken for cancer of the cervix in the last stages. A sloughing uterine polyp presents superficially a similar appearance. But in this case the gangrenous mass will be found surrounded by a ring or collar, often very much attenuated, of healthy cervical tissue; and the presenting tumor is usually elastic to the touch, not unyielding and friable like the cancerous mass.

In the early stages of cancer the appearance resembles closely the erosion of a bilateral laceration of the cervix. In the simple laceration, however, the erosion is soft, not indurated; there are no palpable edges; the cervix is not brawny; and it will be found that the simple erosion yields to local treatment, while the cancerous erosion does not.

Syphilitic ulceration and the ulceration of lupus are very rare upon the cervix. Syphilitic ulceration sometimes presents all the gross appearances of cancer. The history, the microscopical examination, and the therapeutic test will enable one to make a differential diagnosis.

Cystic degeneration of the cervix should not be mistaken for the nodular form of cancer, for the cysts may be seen and punctured, and their character determined. Benign fibroid tumors of the cervix are rare, are usually single, and are larger than the nodules of cancer.

In every case of doubt, in every case in which the physician has the least cause to suspect malignancy, microscopic examination of an excised portion of tissue should be made. The examination of tissue scraped off should not be relied upon. The most suspicious portion of tissue should be seized with the tenaculum and freely cut out. Pieces of tissue

may be thus excised from two or more situations. In the nodular form of cancer a nodule should be seized and excised. It is perfectly justifiable in cases which cannot be thus elucidated to amputate the cervix and examine the whole structure.

The excision of small pieces of tissue may be done without an anæsthetic, as little or no pain is caused by it. Bleeding is very slight, and may always be controlled by a light vaginal compress of gauze or cotton. If the case is not malignant the healing is rapid.

The specimen removed should be placed in seventy per cent. alcohol and submitted to a competent pathologist for examination.

A study of the early symptoms of cancer of the cervix is of the greatest importance. In the early stages the disease may be eradicated with every probability of permanent cure. Cancer of the uterus is more favorable for surgical attack than cancer in most other parts of the body. Excision of the disease is not done in the continuity of an organ or a structure, but the whole organ attached by distinct structures may be removed. The great majority of women with cancer of the cervix come to the operator when the disease has extended too far to permit of any radical treatment. Hopeless palliation is the only course to be followed. This unfortunate condition of things is due to ignorance of the women in regard to the significance of the early symptoms of the disease and to the failure of the physician who is first consulted to insist upon a thorough examination as soon as any suspicious symptoms appear.

There is no one symptom of cancer of the cervix which is present in all cases, and all of the common symptoms may be absent in exceptional cases until the last stages of the disease,—until the disease has extended so far that cure is impossible. It is of great importance to remember this fact, so that the absence of one or more of the classical symptoms of cancer shall not engender a feeling of security which may cause the postponement of a thorough physical examination. The usual symptoms of cancer of the cervix are hemorrhage, pain, and discharge.

Hemorrhage.—The first symptom which should direct our attention to this disease is bleeding from the vagina. Such hemorrhage often first appears as a menorrhagia, as an increase in the amount of blood lost at the normal menstrual periods. The loss of blood may be greater and the duration of the period longer than normal. Sometimes, if the woman keeps quiet during the period, the loss of blood and the duration are about as usual. But if she is upon her feet the loss is increased, and if she begins an active life immediately after the usual

duration of the menstrual period has elapsed, bleeding may reappear for one or more days.

In other cases slight bleeding appears in the menstrual interval. A spot of blood may be discovered upon the clothing. The accustomed leucorrhœal discharge may occasionally be streaked with blood. Such appearances are most frequent after long walking, or standing, or physical work, or after straining at stool, or very often after coitus.

If the woman has passed the menopause, the hemorrhage of cancer may appear as a re-establishment of menstruation,—often to the satisfaction of the woman. This post-climacteric bleeding may occur with more or less regularity,—every month or every three or four months,—or it may appear as an occasional loss of blood after unwonted effort.

All hemorrhage of this kind in women over thirty years of age demands immediate careful physical examination. Any bleeding from the vagina in a woman who has passed the menopause should arouse the gravest suspicion. From the slight hemorrhages which have been just described the bleeding increases in intensity and duration until there is a continuous loss of blood, which saps the strength of the woman and produces the profound anæmia which is characteristic of the last stages of cancer of the cervix. Sudden fatal hemorrhage in this disease is rare.

Pain is not a constant accompaniment of cancer of the cervix in the early stages. Nor is it in any way characteristic. The intensity and the character of the pain depend upon the direction of the growth of the disease. In some cases pain is absent throughout. The pain may be dull, gnawing in character, or it may be sharp and lancinating. The pain may resemble that of uterine colic. It may be referred to the back in the region of the sacrum, or to one or both ovarian regions, or to some parts of the pelvis remote from the uterus, as the crest or the anterior superior spine of the ilium. It may extend down the posterior or the anterior aspects of the thighs or into the rectum. In most cases of cancer of the cervix pain is not a prominent symptom until the later stages.

Discharge from the vagina may be present in cancer of the cervix before there are any symptoms of hemorrhage or pain. The discharge depends upon the position and the character of the growth and the extent of the disease.

It may first appear as an ordinary cervical leucorrhœa in a woman previously free from such discharge, or the discharge of cancer may first appear as an increase of an accustomed leucorrhœa. In such cases

it is due to hypersecretion from the irritated cervical glands. Later in the disease, when ulceration takes place or when the friable vascular vegetations appear, the leucorrhœa becomes puriform in character and streaked with blood. It then becomes thinner, less mucus in consistency, of a constant brownish color from admixture of blood. The pus and *débris* from the breaking down cancerous mass increase, and the horrible odor which is characteristic of the later stages of cancer of the cervix appears. This odor is not peculiar to cancer. It is caused by the sloughing tissue, and is observed when such a process occurs in other conditions, as in sloughing fibroid polyp. The discharge is irritating in character, and the ostium vaginæ, the vulva, and inner aspects of the thighs become excoriated in those who do not observe strict cleanliness. Systemic absorption of the cancerous discharges produces a general septic condition, which, with the anæmia from hemorrhage, and uræmia from obstruction of the ureters, results in the so-called cancerous cachexia. The symptoms which have just been described are those which are most usual in cases of cancer. It must always be remembered, however, that these symptoms vary very much in intensity or prominence and in the stage of the disease at which they appear. Sometimes acute pain, hemorrhage, and excessive discharge are present from the very beginning, even before the presence of cancer can be demonstrated without the aid of the microscope. In other cases all these symptoms may be absent until the disease is very far advanced. None of the symptoms are absolutely pathognomonic of cancer. During the menstrual life of the woman hemorrhage from the womb occurs as a symptom of a great variety of diseases. Moreover, in the post-climacteric period, though hemorrhage should always excite alarm, yet it may be caused by a benign form of endometritis or intra-uterine growth. The pain of cancer may also characterize a variety of benign conditions, and the vaginal discharge, even when most offensive, may be simulated by that from a sloughing intra-uterine fibroid.

No symptoms, however slight, which we know may occur with cancer of the cervix, should even be disregarded.

An examination should be made immediately. There should be no postponement or expectant plan of treatment. If the physical examination is not satisfactory in elucidating the condition, resort should be had to the microscope. If this is not conclusive the case should be watched as long as the suspicious symptoms continue, and further frequent examinations should be made.

If this plan of treatment is followed, and if the women of the community are taught to view with distrust, and not with complacency,

any irregularities of menstruation occurring near the time of the menopause, or any post-climacteric return of menstruation or of irregular bleeding, the surgeon will be able to save hundreds of women with cancer of the womb who are now doomed to horrible deaths.

Cancer of the cervix, like cancer in other parts of the body, is of variable duration. Usually from one to three years elapse between the time when the first symptoms of the disease appear and the time of death. The disease may run its course in exceptional cases in a few weeks. In other cases it may last as long as five years,—especially if the progress is delayed by palliative treatment.

Treatment.—Complete removal of the uterus is the only curative treatment for cancer of the cervix. If the disease is seen in the earliest stages amputation of the cervix beyond the limits of the growth seems, theoretically at least, to be a proper plan of treatment. Practically, however, the operator can never be certain that the excision is made in healthy tissue. The senses of touch and unaided sight are not capable of defining the limits of malignant infiltration. Moreover, it must be remembered that the endometrium is very often involved secondarily from a cancerous focus in the cervix.

Complete removal of the uterus should, therefore, always be practised in all cases in which there is a possibility of removing all of the disease.

The method of operation which I prefer is one which you have seen practised several times during the winter at this clinic. It consists in a combination of the vaginal and supravaginal methods of hysterectomy.

The abdomen is first opened. The ovarian arteries near the pelvic wall and the arteries of the round ligaments are secured with ligatures. Ligatures are placed about the uterine ends of the ovarian arteries near the uterine cornua. The broad ligaments are then divided down to the internal os, and the bladder is dissected from the anterior face of the uterus. A gauze pad is introduced in the bottom of Douglas's pouch and another in the vesico-uterine space. The abdominal incision is then closed with sutures. The operation is completed by way of the vagina. The vaginal cervix is encircled by an incision through the healthy vaginal mucous membrane. Douglas's pouch and the vesico-uterine space are easily and quickly entered. The lower portions of the broad ligaments and the uterine arteries are secured by clamps and the uterus is cut away. The gauze pads are then withdrawn from the peritoneum, and the vagina is drained with gauze. Some of the advantages of this method of operating are the following: The opera-

tion combines the easier parts of the supravaginal and the vaginal methods. The pelvic glands are accessible for examination and removal if necessary. No ligatures are left near the vagina which may become infected and maintain sinuses which persist for months after the operation. The clean part of the operation is done first. The infected cervix is not withdrawn through the peritoneal cavity. Thorough drainage is secured. As you have seen, the operation is quickly performed and the cases have recovered satisfactorily.

Exact statistics in regard to the ultimate results of the operation of hysterectomy for cancer of the cervix are very difficult to obtain. In many reported cases the diagnosis had not been confirmed by microscopical examination. Many women are lost sight of after the operation and their progress cannot be followed. As has already been said, however, the anatomical connections of the uterus are such that, when cancer is limited to the uterus, the prognosis should be very favorable. The immediate mortality after the operation should be small. Every operator of experience has under observation a good many women who have been free from any recurrence of the disease for two or more years. I have recently seen a woman who is in good health seven years after the operation of hysterectomy for extensive cancer of the cervix.

The cases which are not suitable for the operation of hysterectomy are those in which the disease has extended to structures which are surgically inaccessible. Such cases include those in which the bladder or rectum is involved, those in which the vagina is extensively implicated, and those in which the disease has extended into the broad ligaments or the cellular tissue of the pelvis.

When the bladder is involved there is dysuria, vesical pain, and tenderness on vaginal pressure upon the base of the bladder; while the urine is altered in character, containing blood, pus, and in the later stages, broken-down necrotic tissue. Involvement of the rectum is manifest by digital examination.

When the broad ligaments are involved the uterus is held rigidly in the pelvis or is drawn to one side, and the bases of the broad ligaments palpated through the lateral vaginal fornices are thick and hard. When the cellular tissue of the pelvis is generally involved the whole vaginal vault feels indurated, and the uterus seems fixed in the unyielding matrix.

In examining with the view of determining the practicability of hysterectomy it is important to distinguish between cancerous and simple inflammatory involvement of the broad ligaments. The uterus

may be fixed in the pelvis by inflammatory adhesions resulting from old tubal disease and yet the cancer of the cervix may be strictly local and in a stage suitable for hysterectomy. In the simple inflammatory cases the adhesions are more attenuated; they are higher in the pelvis and they lie chiefly posterior to the uterus. They are not directly continuous with the cervix. Frequently the enlarged tube and the adherent ovary may be felt. When the uterus is fixed by cancerous involvement of the broad ligament, we readily feel that it is the base of the broad ligament which is involved. The induration is broad; it is directly continuous with the induration of the cervix, and it lies to the side of the uterus.

Involvement of the pelvic lymphatic glands may sometimes be determined by vaginal palpation, one or more of such enlarged indurated glands being felt lying posterior to the uterus. In most cases, however, glandular involvement can only be determined after the abdomen has been opened.

In general it may be said that the operation of hysterectomy should be performed in all cases in which there is no cancerous involvement of the bladder and rectum, in which the vaginal disease may all be removed, and in which the uterus is freely movable.

In those cases in which complete removal of the disease is impossible the operation of hysterectomy should not be performed, because, cure being out of the question, the symptoms of hemorrhage, pain, and discharge may be as well relieved by less dangerous forms of palliative treatment. When the disease extends beyond the limits of the uterus hysterectomy is much more difficult and dangerous than when the uterus is freely movable. The palliative treatment consists of removing as thoroughly as possible with the curette, scissors, or knife all the cancerous cervix, and the maintenance of the surfaces thus exposed as free as possible from septic infection.

The woman should be placed in the lithotomy position and the cervix should be exposed with the Sims speculum and if necessary with the lateral vaginal retractors. All vegetations and all of the degenerated cervix should then be cut away. It is usually necessary to carry the excision of tissue as high as the internal os. Bleeding during this procedure is sometimes very profuse. It diminishes, however, as the more degenerated portions of the cervix are cut away, and the healthier uterine tissue is reached, and therefore it is always best to complete the operation notwithstanding the hemorrhage. The bleeding may always be controlled by packing the cavity with gauze or cotton,—plain or saturated with Monsell's solution. I have recently checked

bleeding in several cases by packing with cotton saturated with a five-per-cent. solution of antipyrin. In extreme cases it may be necessary to ligate the uterine arteries. If the operation has been thoroughly performed there will be left a large crater or conical cavity in the vaginal vault. This cavity may then be packed with sterile gauze, or if there is much bleeding with gauze saturated with Monsell's solution. Martin sews together the walls of the cavity to diminish as much as possible the raw surface. Other operators char the walls with the actual cautery, or apply nitric acid, chloride of zinc, or other caustic, in order to carry the destruction of tissue still further than has been done with the knife. If the removal with the curette and knife has been thorough it is not necessary to make a caustic application. If, however, the cavity is walled by obviously cancerous tissue the use of the caustic is advisable. If the bleeding is too profuse to permit the immediate application of the caustic the cavity should be packed, as already described, and at the end of twenty-four hours the packing should be removed and the caustic applied. Small dossils of cotton about the size of a chestnut may be saturated with the solution of chloride of zinc (3iv or 3i to 3i of water) and thoroughly packed in the cavity. The vagina and the vulva should be protected from the action of the caustic by greasing with an ointment consisting of one part of bicarbonate of soda to three parts of vaseline.

This packing should be removed from the vagina in forty-eight hours and vaginal douches of one to four thousand bichloride of mercury should be administered. Douches of peroxide of hydrogen (one part of the commercial peroxide to three parts of water) are very useful in diminishing the subsequent discharge. This palliative treatment relieves the pain, the hemorrhage and the discharge. The relief of pain is usually immediate, and may continue throughout the disease. The hemorrhage is usually arrested for several weeks or even months, and the discharge is much diminished with the destruction of the necrotic cancerous mass. The progress of the disease is delayed and life is somewhat prolonged.

HYDATIFORM MOLES.

CLINICAL LECTURE DELIVERED AT THE MATERNITY HOSPITAL.

BY PROFESSOR TARNIER, M.D.,

Clinical Professor of Obstetrics in the Faculty of Medicine ; Visiting Physician to the Maternity Hospital, etc., Paris, France.

GENTLEMEN,—This young woman, who has been pregnant for four months, began to lose blood about three weeks ago. The flow was not abundant and did not take place in jets, on the contrary, the blood escaped in a slow and continuous manner. The patient having been examined it was found that the uterus was normal in form and volume. I dwell upon these two facts, which are of importance, as you will see during the course of this lecture. Several days ago this young woman experienced decidedly strong contractions of the uterus, and the body you see before you was expelled. You will observe that it is a large mass, composed of small bodies of various dimensions, round or oval in shape, and attached one to the other by pedicles. It is what is called an hydatiform mole. Their existence has been recognized for a long time, and though the fact that pregnant women might be taken with pains during the course of their pregnancy followed by the expulsion of a mass of a peculiar appearance was well known, the explanation of the occurrence has not yet been fully arrived at.

What is a mole?

Old obstetricians gave this name to any fleshy mass expelled from the uterus. When a clot had remained for a long time in the uterine cavity, and contained fibrin, it was called a "mole." In studying more closely these "moles" they were found to present very different characters, being occasionally, as I have already said, fibrinous clots, and sometimes fibrous bodies. At present we are able to distinguish one from the other of these formations, thanks, in particular, to the works of Velpeau. But to return to the hydatiform mole. The best definition, in my opinion, would be to compare it to a bunch of white

grapes or currants. Examine a bunch of grapes on the vine and you will find the greatest difference in the development of the component parts of each cluster; some having already reached their maturity, while others are still very small. You will observe the same differences in an hydatiform mole. The vesicles of which it is composed vary greatly in size, which fact adds to its resemblance to a bunch of grapes. Cut one of these vesicles and you will find it to consist of an enveloping membrane, and its contents consist of a tissue so extremely soft that it might justly be called a liquid; in a word, it is a mucous or myxomatous mass.

The first to formulate an hypothesis in explanation of the formation of these hydatiform moles was the celebrated Regnier de Graaf, whose works concerning the mamillian ovum are of great importance. He considered them as unfecundated ova, a very erroneous idea which was soon abandoned, and was quickly followed by the suggestion of another hypothesis. As detached vesicles were sometimes met with, it was supposed that they were nothing more than hydatids, hence the name hydatid mole which is still given to what we to-day call hydatiform mole. Velpeau demonstrated that the vesicles had nothing in common with hydatids, but that they resulted from a hydropic transformation of the characteristic villi of the chorion. This opinion was soon adopted by every one, and in order to give an idea of the thing itself by the name these formations were called "hydatiform moles,"—that is to say, having the form of hydatids but nothing more. Others have called them vesicular moles, but the name hydatiform appears to me preferable.

The pathological anatomy is peculiar. Several observers have reported moles having a special form; they have seen expelled from the uterus a single mass of very regular form and almost spherical. Upon close examination it was found that the membrane enveloping this body was simply the decidua. Now, what should be found in the decidua? It should contain the chorion, the amnion, the amniotic fluid, the cord, and, finally, the fœtus. Upon incision of the membranes, however, they were found to be lined with vesicles grouped around the walls. At the same time the chorion was found present, and to it were attached the pedicles of the mole; an amniotic cavity also existed, of which the amnion was intact in certain portions, and torn in others, and within this cavity the cord and even the fœtus were found, in a word, the complete contents of the normal decidua, plus the mole. Occasionally the contents are not quite complete, some portion, either the fœtus, the cord, or some other part, being absent. This is the type

of the hydatiform mole. I must tell you that I have never met with a case of this kind, still, as these facts have been noted, you should be familiar with them. Most frequently the embryo has disappeared, there is no cord, and scarcely any trace of the amnion, the whole being formed by vesicles. Observations of moles of this kind are quite numerous: every one has witnessed and published accounts of them.

Hydatiform moles are of various sizes; this, you will readily see, depends somewhat upon the size of the uterus, and consequently upon the duration of the pregnancy. Sometimes the latter reaches the full term, and in this case the mole is enormous. I have already told you that two contingencies may present themselves,—either the foetus exists or it is absent. In the first case we say that the mole is embryonic, and in the second non-embryonic. Let us now consider the relation of the mole to the placenta. Several varieties may occur, according to the portion of the placenta which has been subjected to the transformation resulting in the mole. Frequently the entire placenta is destroyed by the vesicle, and sometimes only a very small portion has undergone the vesicular degeneration. In the latter case there may be found not only a foetus, but even a child at term, and living. Such cases are very rare. Let us now pass to a consideration of the medico-legal side of the subject. I have told you that the hydatiform mole was formed as the result of a hydropic transformation of the chorionic villi, therefore in order that a mole should exist, the embryo must also exist, the chorionic villi being merely the expansion of the latter. This implies that the formation of the mole is impossible without fecundation,—i.e., the intervention of the male. Formerly, when a woman not supposed to be pregnant expelled a mole from the uterus, it was accepted as a fact, in accordance with the theory of Regnier de Graaf generally accepted at that time, that this woman had not been fecundated, which opinion was an absolute error.

Again, let us suppose that a woman has the abdomen enlarged; every one believes her to be pregnant, which is actually the case; she is taken with severe pains, and gives birth to an enormous mole. This mass is disposed of, and as there is no child, the woman is suspected, and is perhaps accused of infanticide.

Can this accusation be regarded as just? In a general way, perhaps yes, perhaps no. The possibility of the presence of a mole must not be overlooked, and if, for instance, the woman states that she was delivered of something resembling a bunch of grapes, you follow up the clue thus given, show the suspected mass, and the accusation is thereby refuted and the woman saved from an unmerited condemna-

tion. Medical experts cannot be too particular in studying these cases, and should always consider the possibility of their existence, whenever the accusations are not based upon incontestable facts.

What are the relations existing between the mole and the decidua and the uterine walls? The decidua is sometimes torn and sometimes intact. The vesicles come into contact with the uterus which develops regularly, except in those cases in which a certain peculiarity presents itself,—I refer to the vesicles which are seen upon the uterine surface, owing to the greater development at those points. The vesicles having come into contact with the uterine wall may not have their development arrested at this point, but may separate the muscular fibres and penetrate into the thickness of the wall itself, even, it is said, extending to the muscular tissues. This penetration may assume such proportions that the uterus at this period becomes exceedingly thin, having merely the thickness of a sheet of paper. These cases are very serious. Death is not rare, and is sometimes spontaneous. A pregnant woman dies with the symptoms of internal hemorrhage, and the autopsy may show the uterus perforated at a point where the vesicles have invaded the entire thickness of the wall. These cases must be considered from another very important point,—I refer to the danger which the patient runs during operations. Let us suppose that a woman has hemorrhages. Having tried in vain all the means in your possession, you decide upon more energetic intervention,—i.e., the introduction of the hand into the uterine cavity for the purpose of removing its contents. The finger is carried around over the entire surface of the uterus, and if you are not forewarned and do not use the greatest precaution, you may very easily perforate the uterus and kill the woman by internal hemorrhage. This possibility should always be borne in mind when one wishes to operate in cases of this description.

How may this condition be recognized? It develops in the following manner. At about the third or fourth month the uterus enlarges more rapidly than it should in the normal state. Hemorrhages appear at the same time, which are more remarkable for their continuousness than for their abundance. I may here add that these hemorrhages though not severe are nevertheless dangerous on account of the debility which they finally occasion. We here have two important symptoms, first the more rapid development of the uterus and afterwards the hemorrhages. When you meet with these two symptoms you will say to yourselves, here is a woman whose pregnancy deviates from the normal type and may indicate the existence of an hydatiform mole. It is true that this condition is strongly indicated,

but its presence cannot be absolutely affirmed, because other cases may give rise to the same symptoms. For instance, twin pregnancies and hypersecretion of the amnion occasion a more rapid augmentation of the volume of the uterus, and detachment of the placenta causes hemorrhage of a similar character to that occasioned by hydatiform moles. It is true that in the case of these moles irregularities of the surface of the womb are sometimes met with, but the same thing occurs in some twin pregnancies. I may add that there is, nevertheless, a certain difference between this condition and hypersecretion of the liquor amnii, in which the abdomen develops in a regular manner, but with regard to twin pregnancies the question always remains doubtful. In examining the woman one occasionally meets with several vesicles which have fallen into the vagina, which makes the diagnosis positive, but these cases are, unfortunately, very rare.

The hydatiform mole is dangerous for the mother and child, but more so for the latter, as it nearly always dies. As for the mother, she is in danger of death from hemorrhage; in other cases she succumbs after rupture of the uterus and consequent internal hemorrhage. The statistics of cases reported give a mortality of thirteen per cent.

In the treatment of the hydatiform mole, first of all, the attention should be directed to the prevention of the hemorrhage. If this cannot be accomplished abortion should be induced, but avoid violent measures, such as curettage, for instance. Remember what I have already said concerning the weakening of the uterine walls. The least imprudence with a curette may cause rupture and consequently death. Thorough antisepsis and an expectant plan of treatment is better than curettage. There remains for me to say a few words concerning the frequency of hydatiform moles. They are rare. Each year I see one or two which are generally referred to me by midwives. I have met with a considerable number in hospital practice, but in private practice I have only met with one case,—a young woman pregnant for two or three months. She had always enjoyed very good health, and had been married four months. Suddenly she became subject to slight but continuous uterine hemorrhage. Upon examination the os was found closed and undilated, the uterus rather large for the duration of the pregnancy. There had been no twins in the family, so that I concluded that I was dealing with an hydatiform mole. Several days later the young woman was taken with pains and a mole was expelled. In this case I did not make a positive diagnosis. In the case of the patient forming the subject of this lecture the uterus was normal in volume, and had developed in a regular manner,

and in view of the slight hemorrhage presented by the woman, I was led to suppose that she was about to have a miscarriage, and did not consider the possible existence of a mole.

In closing I would say that the diagnosis presents great difficulties ; but the two symptoms I have indicated, the absence of a history of twins and the presence of the elevations over the surface of the uterus, would justify you in saying that the presence of a mole was probable, but you should content yourself with this and go no further.

TORSION OF THE PEDICLE IN OVARIAN TUMORS.

CLINICAL LECTURE DELIVERED AT THE TREMONT DISPENSARY, BOSTON.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Assistant Professor of Surgical Pathology in Tufts College; Member of the Société Française d'Electrothérapie · Corresponding Fellow of the Maine Academy of Medicine and Science; Director of the Gynæcological Clinic, Tremont Dispensary, etc.

GENTLEMEN,—Various causes have been attributed to the production of rotation of ovarian tumors on their axis, for the reason that the causes and mechanism of torsion are most difficult to account for in a given case, and it has been impossible to establish an etiology applicable to all cases.

Change in position or sudden movements of the body, abdominal palpation, and pressure on the abdomen, appear to be quite frequent causes in the production of this complication.

Tait admits the influence of alternate distention and emptying of the rectum, and mentions nine out of ten cases that have come under his care in which rotation took place from left to right,—that is to say, the anterior aspect of the tumor moved from left to right, while the posterior surface underwent an inverse movement from right to left. This cause, he says, certainly acts more on tumors occupying the right side of the abdomen than those on the left, because the former are so situated that the expulsive force of the rectum comes in the oblique direction and at about right angles with the axis of rotation.

It is to be remarked that, in four-fifths of the cases reported by Rokitansky, the tumor was on the right side, and torsion took place from left to right in a still larger proportion. Segond says that if Tait's theory is to be accepted, torsion of the pedicle should be the rule in the majority of pedunculated tumors of the ovary, which is far from being the case, and he believes, with Heurtoux and Quénu, that this theory only merits a limited consideration.

For my part, I think that Freund's theory is probably the correct

one. He has demonstrated that during their growth ovarian tumors undergo changes of position at two different stages. In the first, while they are still in the pelvis, their tendency is to grow downward behind the uterus and to retain their pedicle on their anterior aspect. In the second stage, they rise out of the pelvis and tend to fall forward on the abdominal wall, and their pedicle is then found on their posterior aspect.

Fischer has recently studied the law formerly taught by Professor Goodsir, that there is a spirality guiding the growth of all organisms, and he maintains that axial torsion is a function of the living cell. Bilateral symmetric organisms possess on the right side of the body sinistro-spiral growth torsions, and on the left dextro-spiral torsions, and he admits that this is true of the ovaries, tubes, and broad ligaments. Freund has examined Fischer's investigations as regards the pedicle of ovarian tumors, and concludes that in all cases in which an ovarian tumor reaches the second stage and has no obstacle to its usual progress, there will be found a torsion of its pedicle, to the left in right-sided tumors and to the right in left-sided growths.

This theory is also in accord with the fact that the nature of the tumor in no way influences the production of torsion of the pedicle. It has occurred in every description of ovarian, parovarian, and fibroid tumor, the conditions necessary for its production being *perfect mobility* and a *pedicle sufficiently long* to allow of rotation.

It is generally admitted, however, that this complication occurs more frequently in dermoids. Fränkel considers as the most frequent predisposing cause of torsion an unequal and irregular growth in ovarian cysts, which causes a displacement of the centre of gravity of the tumor, resulting in rotation on its axis.

Terrillon operated upon three cases of cysts in which torsion of the pedicle had occurred, and in which he found the tumor had displaced itself from one side of the abdomen to the other, and it occurred to him that this displacement is one of the principal causes of torsion. I, myself, have under observation at the present time a maiden lady, aged about fifty, who has a small dermoid cyst about the size of a large orange, which can be pushed easily from the right iliac fossa, in which it is usually to be found, to the left. This patient I am watching closely, gentlemen, for the reason that in time torsion or some other complication may occur. The only reason I have not advised operation is that the patient is at present going through the menopause. An operation is decidedly indicated as soon as the phenomena attending this condition have ceased.

Circulatory troubles associated with the menstrual flow have also been noted in the etiology, but up to the present time their importance has not been established in a precise manner. The pregnant uterus, or the coexistence of another abdominal tumor, has quite a marked influence in facilitating or even in producing torsion of the pedicle. These are fatal circumstances, for the displacement of the cyst is, as I have already said, an essential condition for the production of torsion. Labor itself, as you can readily understand, briskly changes the relations of the organs of the pelvis to each other, and will allow an abdominal tumor to move more freely.

The puncture of a cyst has been given an important place in the production of torsion of the pedicle. Malins and Thornton have published several cases in which torsion of the pedicle has occurred after puncture of the tumor. Schroeder relates a very interesting case of atrophy of an ovarian cyst occurring after puncture, which was due to the torsion of its pedicle. He demonstrated this fact, when he operated on the patient ten years later, by comparing this atrophied cyst with another cyst developed on the opposite side. The atrophied tumor had a twisted pedicle, and was made up of two pockets; one containing a yellowish liquid, the other filled by a mass which might well be compared to mustard. Schroeder's patient, who found her cyst atrophied after the puncture, thanks to the torsion of the pedicle, is perhaps a unique exception to the rule. It is necessary when puncture is performed to put the patient in the best possible condition, in order to avoid this complication, prescribing absolute repose in bed for several days, and besides applying a tight bandage to the abdomen, composed of a thick layer of cotton and a flannel bandage to render the parts immovable. Terrier is even more careful and passes the binder under the back of the patient before he aspirates.

The predisposing action of certain anatomical characters of the tumor appear less probable than the influence of the several causes I have just reviewed. It is easy to admit that a small tumor is more apt to turn on its pedicle than a large one; out of the fifty-seven cases which make up Thornton's statistics, in thirty-six the weight of the tumor was less than ten pounds. Schroeder, Hoffmier, Breisky, and Stambourg have, however, seen torsion occur in cases of very large tumors.

The length and the smallness of the pedicle is also an important factor which has often been noted. In a case reported by Tedenat there was a proliferating papillary cyst in each ovary. Both of these cysts, each of which was the size of a foetal head at term, was provided with a long thin pedicle. The patient had twice had quite serious peri-

toneal symptoms, and Tedenat operated at the end of the third attack. The pedicle of the cyst on the right side was twice turned on itself, and the tumor was pushed forward and to the left of the pedicle of the left cyst. The cysts were adherent to each other, and the cyst on the right, with a twisted pedicle, contained blood and presented patches of necrosis. In spite of the numerous adhesions with the small intestine and the mesentery, which necessitated the use of some ten ligatures, the patient made a rapid recovery. The same surgeon has operated four times for cysts of both ovaries, all of which were papillary, and, in spite of the length of the pedicle in all four cases, he has not seen torsion occur in any of them. In the fifth case of papillary cysts of both ovaries coincident with a large myoma of the uterus, the pedicle on the right side had undergone torsion of two-thirds of its circumference. The tumor, which was the size of an adult head, was distended by sero-sanguineous liquid.

Imbert has published a most interesting case from an etiological point of view of torsion of the pedicle. This was a cyst developed below the tube and on the inner side of the ovary. The ovarian ligament had contracted adhesions with the tumor, which were so intimate that they could hardly be distinguished from it. On either side the ligament, which was adherent to the ovary, was also adherent to the pelvic walls, to which the ovary was united by fibrous adhesions of considerable firmness. The ovarian ligament did not follow a progressive lengthening in relation to the increase of size in the cyst, and was consequently drawn over the tube, and in this situation had a tendency to bring the anterior aspect behind and outward,—that is to say, it drew the cyst in the direction in which rotation was produced. This influence was not the only one, we can easily admit, but the ligament of the ovary had necessarily exercised an influence on the direction of the rotation.

Tedenat, who has performed two hundred and sixty-one laparotomies for ovarian tumors, gives the following table: ten were solid tumors, fifteen were tumors included in the broad ligament, seventeen were dermoid cysts, twenty were papillary cysts, six cases had bilateral cysts, and one hundred and ninety-nine cases were proliferating glandular cysts. Out of this number, twelve cases presented torsion of the pedicle, and it is probable that torsion was present in other cases, but was not noted at the time of the operation.

I will just mention a few more authors to show the frequency of torsion in ovarian cysts. Rokitansky found 13.7 per cent.; Schroeder found 13.9 per cent.; Thornton, 8.5 per cent.; Howitz, 23.2 per cent.;

Olshausen, 6.5 per cent. ; Péan, 6.1 per cent. ; Terrillon, six per cent. ; Tedenat, 4.6 per cent.

Antisepsis has considerably diminished the danger of laparotomy, and the idea which formerly occupied the public mind against operation is now done away with, and patients with cysts accept operation early when it is offered ; consequently cases of torsion are greatly reduced.

The pedicle of an ovarian cyst is the attachment which connects the tumor with the rest of the organism, and which serves, certainly, at least, during the first part of its evolution, as a means of fixation and nutrition. It is generally made up of a part of the broad ligament, of the ovarian ligament, and quite generally by the tube, a part of which usually is in connection with the superficial part of the tumor. Sometimes the tube is united to the cyst by fibrous ligaments.

The narrowest point of the pedicle is usually at that part that is called the infundibulo-pelvic ligament, which is nothing more than a fold of the peritoneum, extending from the pelvic wall to the ovary by which the vessels reach the organ.

The vessels of the pedicle are extremely large, the arteries being furnished by the utero-ovarian and also by anastomoses with the uterine artery when the cyst becomes adherent to the uterus. The arteries of the pedicle occupy the same relation between themselves as the arteries from which they come. On the internal border these are branches of the uterine artery, and on the external border branches of the utero-ovarian artery. The number and calibre of the vessels vary with the size of the pedicle. In a long, thin pedicle, the arteries are few and small. The opposite condition of affairs is found in broad, short pedicles. The veins are larger than the arteries and parallel with them ; they are made up of thick and very muscular walls, and for this reason, gentlemen, you must not take them for arteries, a mistake which may easily occur on the operating-table. In certain places the veins may be confounded with the tissues which surround them. I cannot give you any better idea of their appearance than to call to your mind the *dura mater*. The lymphatics are extremely numerous on the walls and are directly continuous with those of the broad ligament.

The existence of nerves in the pedicle is admitted by Hegar and Kaltenbach in all cases, and Schroeder found a trunk the size of the ulnar nerve. On the other hand, I would say that Vercoutre denies the presence of nerves in the pedicle. All the elements of the pedicle are united by connective tissue, and sometimes by unstriped muscular fibres, the whole being covered by peritoneum.

Nussbaum, Spencer Wells, and Worth have described double pedicles, and according to Hegar and Kaltenbach this condition is due to a splitting up of the distended broad ligament between the ovarian ligament and the tube, or between its two wings and the infundibulo-pelvic ligament.

Astruc mentions a case of cyst with a double pedicle, and thinks that it resulted from intimate adhesions between two cysts, one in the right ovary and the other in the left. The right ovarian cyst, which was the size of two fists, contained a bunch of hair and two teeth; the left was a glandular proliferating cyst the size of the adult head. The latter had a pedicle five centimetres long and three centimetres in breadth. The dermoid cyst had a pedicle ten centimetres long and about the size of the finger. It appeared distended, and was exceedingly poorly nourished. The patient recovered. The same author mentions the case of a woman, thirty-seven years old, with a large parovarian cyst containing intra- and extracystic papillary vegetations which adhered to the uterus. The left ovary, which was in a condition of microcystic degeneration, was the size of a small orange, adhered solidly to the cyst on the right, and presented a slight torsion of its pedicle.

The pedicle may be twisted slowly or suddenly, and the number of turns may be from one-half up to five or six. The usual number is about two or three. As you might imagine, the gravity of the symptoms produced by torsion is not always in relation with the number of twists of the pedicle. A half turn and a band or adhesion may produce strangulation and necrosis of the cyst.

Torsion is usually accomplished from without inward. By this I mean, gentlemen, the anterior aspect of the tumor becomes external, posterior, and internal successively in order to accomplish complete rotation. Spencer Wells has observed rotation occurring from within outward, from without inward, and even oblique rotations from before backward. Olshausen was one of the first to draw attention to the possibility of rotation in the opposite sense, of cystic tumors of the ovary which had undergone torsion of the pedicle. Many other authors have mentioned the same facts.

It now remains, gentlemen, for me to consider the phenomena following torsion. Now, as to the vascular condition, slow torsion naturally produces a hinderance to the circulation, while a sudden torsion arrests the circulation. The effects of the hindered circulation produced by a slow torsion of the pedicle are similar to those which would be produced by a ligature placed on the pedicle. If this ligature is not

very tight, the circulation is simply hindered in the veins, and the vascular pressure is increased in the arteries. This is exactly what happens in the circulatory system of the cyst, from which follows a sanguineous infiltration in the walls of the tumor and its pedicle.

An œdema of the pedicle may occur, and of the tumor as well, caused by a serous transudation which swells the walls, and is extremely favorable to the production of adhesions. If the constriction occurs in a very progressive manner the nutrition is diminished and the cyst may undergo a decided fatty or calcareous degeneration.

Breisky mentions a case of this degeneration which he found in a most marked degree. He made the diagnosis of ovarian cyst reaching above the umbilicus. After a very painful attack he found an increase in the size of the tumor, and shortly after a diminution in its size; nine months afterwards the tumor was only the size of a child's head; six years later it was only the size of a hen's egg.

But, gentlemen, unfortunately, this case is an exception, and the general rule is that the adhesions form between the cyst and neighboring organs or the abdominal wall, and these adhesions are very vascular, and aid considerably in the nutrition of the cyst. Now, if we suppose that a ligature is tightly tied on the pedicle, which corresponds to a sudden torsion, this is what happens to the pedicle and tumor: the veins which are superficial and are less resistant than the arteries on account of their structure are compressed, the latter, no matter how sudden the torsion may be, allow blood to flow through them for a certain time, consequently the rapid increase of the tumor at this time is easily understood. The return circulation is cut off, while the arterial blood goes in under higher pressure, the veins become distended until their walls, which are too weak to resist the pressure, allow the liquid blood to escape either into the interior of the cyst or in its walls, thus forming an enormous extravasation. In other cases the blood may escape directly into the peritoneal cavity, and then we have to deal with internal hemorrhage.

Spencer Wells mentions several examples of serious and rapid hemorrhage occasioned by this mechanism; but I would add that hemorrhage rarely takes place into the abdominal cavity. It is more often in the cavity of the cyst or in its walls that the blood collects. The arteries in turn are compressed by the rapid torsion and by strangulation of the pedicle, and the line of limitation will be found to be of a grayish color, or rather the hue of a dead leaf, which, as you know, is the characteristic aspect of gangrene. The pedicle may even become completely separated, but this is not very frequent.

When the constriction has not been sufficient to produce necrosis there is always a great friability of the tissues, and this is extremely important to remember. Péan says that in all cases in which torsion of the pedicle has occurred this latter is small and friable, so that when the tumor is removed it is necessary to take extra care in order that it may not be torn away; and to prevent this, grooved hæmostatic clamps should be applied as preventive hæmostasis, and the ligature should not be tightened too suddenly, because it may cut through the pedicle. To this friability of the pedicle may be attributed the case reported by Malins, in which an external examination was sufficient to separate the tumor from its attachment.

But whether the pedicle be separated or twisted on itself, so that the circulation is completely interrupted, the destiny of the cysts is quite variable. According to Terrilon, they become gangrenous in the parts which are least supplied with vessels or where nutrition is the least active. Others have been observed having numerous adhesions containing large vessels, and were even nourished more abundantly than they would be by their pedicle. They increase in size, and continue a normal physiological life such as they had before torsion or before separation from their original pedicle had occurred. Others remain stationary in size, or very nearly so, while some grow more or less for a certain time and then stop increasing in size.

When, after torsion, the supply of nutritive material becomes insufficient, the cyst may shrink up and its contents be absorbed little by little, as in the case of Breisky, that I have already mentioned. But whatever their transformation may be, it is to be remembered that every transplanted cyst, if it has a real pedicle, may be the starting-point of new accidents produced by torsion or ruptures of its newly-formed pedicles.

Torsion of the pedicle usually brings about anatomical changes in the peritoneum, in the intestine, and the broad ligaments. Under the influence of the circulatory trouble and inflammation of the cyst during slow torsion, irritation, congestion, and inflammation of the peritoneum and its folds have been observed. Adhesions more or less numerous occur between the peritoneum and the tumor. These may be so vascular that in certain cases they have been quite sufficient to nourish the cyst even if the tubo-ovarian vessels of the pedicle have been compressed. These adhesions become all the more thick and resistant the greater the time since torsion has occurred. They may also become connected with the anterior abdominal wall, with the uterus, or with the small intestine. When a torsion occurs suddenly with hemor-

rhage and rupture of the cyst, the peritoneal cavity will be found to contain a serous or gelatinous liquid, red or chocolate-colored blood, according to whether the rupture is recent or of some standing. Acute peritonitis usually supervenes after a rupture has occurred.

Torsion sometimes produces thrombosis of the veins of the broad ligaments.

I have only one other accident to mention which occurs sometimes in sudden torsion of the pedicle. This is intestinal occlusion. A very remarkable case occurred when I was connected with the Butini Hospital in Geneva. It was that of a woman aged thirty-six who had always been in very good health. She had had one child about eight years previously and had remained sterile since. She had noticed that her menses had increased somewhat in quantity during the last two or three years, and had complained of pain in the right side, but had not attached any great importance to it. She entered the hospital for this pain in the right side, which had suddenly increased one morning after she had jumped out of bed rather suddenly. On examination the right iliac fossa was found distended, with *great tenderness over McBurney's point*. The patient had been having natural movements of the bowels, and her pulse and temperature were normal. Through the vagina the right iliac fossa was found to contain a rather large mass which extended high up. The patient was watched very carefully for four or five days. During this time the bowels became exceedingly constipated, and a week after entering the hospital, after having complained of some pain in her bowels, her temperature was taken and found to mark 39.5° C. The iliac fossa was extremely tender. The patient was immediately prepared for laparotomy, which was performed at once. When we opened the abdomen a distended dark-blue gangrenous intestine presented itself in the wound, and we regretted that we had not operated on this patient a few days earlier. But on enlarging the incision in order to get what we thought was the intestine well out of the abdomen to perform resection, we rolled out a large dark-red tumor the size of a small adult head, and upon closer examination we found that we were dealing with a cyst of the right ovary, with torsion of the pedicle. This tumor had already contracted many adhesions to the abdominal wall, but as they were only of a few days' standing they were very friable and vascular, and were easily torn off, and the bleeding points ligated.

I mention this case, gentlemen, to show you how this accident may be mistaken for appendicitis, for in this case we had every symptom of the chronic form, resembling especially the tubercular variety.

Let me also add that the pedicle may become rolled around a loop of intestine so that it may obstruct the canal completely, and this has occurred several times, especially in cases in which the cyst had already contracted adhesions before torsion had occurred. Part of the intestine may be strangulated by pressure from an adhesion.

You will probably ask, gentlemen, why I have gone into such detail regarding torsion of the pedicle, and in reply I would say that I have taken a patient to show you at the clinic to-day who in all probability presents this condition of affairs. She is a woman of twenty-nine years of age, and, as you perceive, she is slightly built and rather anæmic. Her history is extremely brief. She has had one child, four years ago. Her menses have not appeared for the last two months, and it is for this reason that she came to consult us to ascertain if she might be in the family way; but on questioning her, and after examination, I came to the conclusion that a more serious condition of affairs was present. Two years ago she had been troubled with a slight attack of pain in the left iliac fossa, at which time she came to the City Hospital, where she was treated, and a diagnosis of ovarian cyst was made. After a few days' stay in this hospital she returned home, and with the exception of an occasional pain in the iliac region she has been very well. For the last two months she has had sharp pains in the left iliac fossa accompanied by nausea which has lasted six or seven days. She has also experienced a sense of weight in the kidneys and in the pelvis. The pain, during the last three days, has been excessively sharp, and the nausea, she tells us, has been almost constant. She has also noticed that the left side of her abdomen has somewhat increased in size within the last fortnight.

By bimanual palpation I find the uterus in physiological ante-flexion, although the fundus is slightly pushed to the right. The right iliac fossa and the right adnexæ appear normal. In the left iliac fossa I make out a large globular mass, tense, elastic, probably having the size of a small adult head. Much pain is elicited on pressure of this tumor.

This patient, gentlemen, in all probability, is an example of slow torsion of the pedicle of an ovarian cyst, and I have advised her to be operated upon within the next forty-eight hours in order to avoid more serious consequences, and I trust she will consent.

Of course, I cannot be absolutely certain of my diagnosis, but, taking all the symptoms into consideration, I think that in all probability I am correct.

It is generally accepted, at the present time, that all accidents of

torsion of the pedicle in ovarian tumors are a formal indication for the performance of laparotomy, and it is of the greatest interest to find out as exactly as possible the various clinical forms that this condition of affairs may take on.

When strangulation is complete, due to sudden torsion, the diagnosis is relatively easy. The accidents are tremendous in their intensity and in their rapidity.

All of a sudden, without any appreciable cause, or on account of a sudden movement on the part of the patient, the woman suddenly feels a sensation of displacement low down in the abdomen, or she may say that something has given way inside. These sensations are immediately accompanied by violent pain. This pain, which is in the first place localized in the tumor, and more especially over the pedicle, is quite similar to hepatic or nephritic colic, or the pain of chronic appendicitis, as I pointed out in the case already mentioned; it shoots towards the lumbar region of the same side as well as into the same thigh, and soon becomes generalized over the entire abdomen. The general symptoms of extreme violence appear soon after. The patient experiences an indescribable malaise, mucous, bilious, or even fæcaloid vomiting occurs, and this may happen even if the intestine is not included in the torsion. Respiration, which is accelerated on account of the pain experienced in the diaphragm, takes on the upper costal type. The pulse increases and may reach one hundred and ten pulsations or even more. It is small and filiform. The temperature usually remains normal, although, in some cases, when gangrene has taken place, it will rise. The *facies* changes and the skin is covered with cold perspiration. The tumor will be found to have greatly increased in tension and volume and to have become immovably fixed.

Mouls mentioned for the first time in 1890 two very important symptoms which he discovered in two patients,—namely, *a systolic murmur heard with the stethoscope over the pedicle, and an undulation en masse of the tumor, synchronous with the arterial pulsation*. In the same year Raboul found in three cases two signs which permitted him, particularly in the last, to make an exact diagnosis before he operated. These signs were a murmur, very distinct and systolic, which was found over the painful point,—that is, over the pedicle of the cyst, and the movement *en masse* of the tumor, giving to the hand the sensation of a rising up or an undulation which was coincident with the arterial pulsation.

The very serious symptoms that I have mentioned are not due to peritonitis, for the simple reason that it does not as yet exist. They are

due to the torsion, and this is how we can explain them: it is known that the slightest irritation of the abdominal organs which are tributaries to the solar plexus may provoke very severe general symptoms of a reflex nature, while deep lesions of these same tissues, which have a slow evolution, pass sometimes without being discovered.

Now, gentlemen, the ovary receives nerve fibres from the solar plexus, and the irritation of its branches contained in the pedicle of the cyst sufficiently explains the phenomena observed. For that matter similar symptoms have been noticed following ovariectomy, hysterectomy, and operations performed on the internal genital organs of a woman.

There is another serious danger from torsion of the pedicle which may occur in the most precocious manner. I refer to hemorrhage.

This may be so severe as to be mortal. Both Spencer Wells and Patruban have reported cases of death from hemorrhage. Patruban's patient died four hours after the appearance of symptoms.

The symptoms of internal hemorrhage are, as you know, paleness of the integument and lowering of the temperature of the body, especially of the extremities, a small irregular filiform pulse, and soon convulsions, and finally syncope. When the walls of the cyst are not torn under the force of the blood-pressure they dilate, and a symptom which is easily discovered is the *considerable increase in the size of the tumor*.

Hemorrhage, as I have said, may sometimes cause death. In other cases it may simply produce a most severe anæmia accompanied by a few abdominal symptoms. When torsion of the pedicle has produced complete constriction of the arteries and veins, the danger of hemorrhage is much less, because in this case the cyst is deprived of its nutrition, and gangrene, another serious complication, may occur. From this gangrene an auto-infection produces a kind of septicæmia, which is followed usually by death if the patient is not relieved by operation.

Lawson Tait has reported three patients who had torsion of the pedicle with gangrene of the cyst. All were operated on with successful results. One of them was pregnant, and on account of a very rapid enlargement of the abdomen, it was supposed that some pathological condition was developing in the ovum. Acute abdominal pains followed by general malaise decided Tait to operate. A parovarian cyst on the right side was found with the pedicle twisted three times on itself. The tumor was gangrenous, and, what is more remarkable, the pregnancy went on to term without accident after the operation. Many other surgeons have had similar cases, and all are of the opinion

that the operation should be performed at once, as soon as the diagnosis is arrived at.

But, gentlemen, it often happens that patients who have cysts of the ovary and who have presented symptoms of torsion, suddenly notice that their tumor diminishes considerably in size or even disappears. This is due to rupture of the cyst, and acute peritonitis is generally the result. In other cases all the symptoms which appear to menace the life of the patient for several days diminish in intensity little by little, and patients enter into the chronic stage of their disease and soon symptoms of localized peritonitis appear.

Adhesions form between the tumor and neighboring organs (intestine, mesentery, and abdominal wall). If the blood-supply is insufficient, the cyst may undergo fatty or calcareous degeneration, but if the nutrition is sufficient, after a certain time remaining in a stationary condition, the tumor will commence to increase in size.

These patients are continually tormented by pains in the abdomen, which render them quite unable to perform their duties, and they are often obliged to keep their bed. (Edema and emaciation occur and the patient presents a typical cachectic condition. The skin is a dirty yellow, and if care is not taken, the diagnosis of malignant tumor might be easily made.

Ascites may occur at this period, and is a bad symptom for the patient.

The diagnosis of torsion of the pedicle in ovarian cysts is always easier when you are already aware that your patient has a cyst, because you will immediately think of the complication, if your patient experiences a sensation of displacement of the tumor or of violent pain followed by vomiting after a fall, a sudden movement, or after natural labor. If, after careful examination, you find the tumor is immovable and that it has rapidly increased in size and presents an extreme degree of tension, you will be perfectly correct if you make a diagnosis of torsion of the pedicle.

But, now, as all cases that you will meet are not typical, you must remember other means by which you can assure yourself of your diagnosis. You should listen for a systolic murmur over the pedicle and note the undulation *en masse* of the tumor corresponding to the systole of the heart.

Exploratory puncture of the cyst may be performed with all rigorous antiseptic precautions, but remember that a purulent or bloody liquid is a common product of many abdominal tumors, consequently this operation will only be of diagnostic value if you draw off a

chocolate-colored liquid having a gangrenous odor. This is a pathognomonic sign, because gangrene of an ovarian tumor can hardly ever occur unless there is torsion of its pedicle.

Torsion must not be confounded with rupture. In the first instance the size of the tumor increases, while in the second it diminishes. The sudden appearance of acute peritonitis is the usual fatal consequence of rupture.

Strangulation of the pedicle by fibrous bands is impossible to be differentiated from torsion. As to separation of the pedicle it is shown by a mobility more or less considerable subordinated to the number of adhesions.

If the clinical symptoms which characterize sudden torsion are attenuated you will then be in the presence of a case of slow torsion.

The diagnosis becomes extremely difficult in those cases where you are called without the knowledge that a tumor is present in the pelvis. The patient may also be ignorant of this fact, consequently the torsion is the first indication of the presence of an ovarian cyst. To make your diagnosis, you must proceed by exclusion, to eliminate all the causes capable of producing this same accident, especially intestinal occlusion and peri-uterine hæmatocele. This differential diagnosis should also be made when symptoms of torsion of an already known cyst are not very marked.

Internal strangulation produces, as does torsion, a sudden violent pain with mucous vomiting, but the considerable swelling of the abdomen, the frequency of the vomiting which later becomes fæcaloid, the absolute constipation, and the absence of gas passed by the rectum will allow you to make the diagnosis of internal strangulation.

The torsion of a cyst in the pelvis occurring at the time of the menses has in the first place the same symptoms as a peri-uterine hæmatocele,—namely, sharp sudden pain with a tendency to syncope, small filiform pulse, etc., but the tumor formed by the hæmatocele can hardly ever be limited as it can be in the case of an ovarian cyst. Its consistency is elastic and in some cases fluctuant. Then after three weeks or so it becomes compact and hard to the touch. These indications sometimes will allow you to make out the cause of the accident.

If the cyst has ruptured and hemorrhage has occurred, it is almost impossible to make a correct diagnosis. For that matter, gentlemen, there are many difficulties in establishing a precise and correct diagnosis. The examination of the patient is often impossible on account of extreme pain in the abdomen, which is greatly increased by the slightest touch, and consequently exploratory incision is decidedly in-

licated to make a diagnosis, and an operation is necessary in order to save the patient from these serious and rapidly fatal complications.

As to the prognosis of these cases you will readily see how variable this may be if you recollect what I have already said. According to Terrillon four varieties of cases may be differentiated. The first class are those in which torsion has occurred so slowly that it has given no symptom, in which case this torsion will be eventually favorable. It is an obstacle to the nutrition of the cyst which decreases in size and sometimes undergoes fatty or calcareous degeneration, resulting in a cure by atrophy.

The second class are those in which torsion has produced slight symptoms. The patient has felt some pain due to tympanism, but the tumor has been seen to follow a regression as in the first class.

The third class are those in which serious symptoms occur at the beginning, which last only for a short time and decrease afterwards. The prognosis is worse in this class. The alarming symptoms grow less and less, but soon the symptoms of localized peritonitis around the tumor occur. Adhesions form which are often extremely vascular and which will cause great difficulty later when the time comes to operate on the patient. The walls of the cyst and the pedicle undergo atrophy, which, as you easily see, increases the chances of danger for the patient.

The fourth class is that in which there is rapid strangulation accompanied by symptoms of acute peritonitis. Death is so sudden sometimes that you will not have time to operate. It may be the result of hemorrhage and acute anæmia. Rupture of the cyst is more frequent in these cases, and this is followed by acute peritonitis and septicæmia. The tumor may become gangrenous and the patient die in extreme cachexia. Intestinal occlusion may also occur which renders the prognosis still worse.

Pregnancy and the puerperal condition are unfortunate circumstances, because out of nine patients operated upon under these conditions, either before or after labor, there were three deaths and six successful results in the hands of Kœberle.

As to the treatment, gentlemen, the only one that is rational, if the patient presents symptoms of torsion of the pedicle, is abdominal incision. This should be performed as quickly as in a case of strangulated hernia, and the chances of success are all the greater if the operation is performed early.

Boiffin has reported two cases of torsion of the pedicle, one of which he operated on, sixty hours after the beginning of the symptoms,

with successful results. The other patient died ten days after operation. She had put off the operation for about six months. Delay exposes the woman to great danger, such as hemorrhage, gangrene, rupture of the cyst, and acute peritonitis. If these complications occur, the patient's vital power is lowered by the hemorrhage and the pain. But none of these are contra-indications for performing laparotomy; on the contrary, gentlemen, they should hasten you to perform it. The examples are numerous in which patients had gangrene of their cysts or peritonitis and recovered after operation, which was the only possible means of arresting the progress of these secondary accidents.

Pregnancy should not stop you from operating, but you will take the precaution to make the incision as small as you can so as to avoid evisceration, which will certainly occur if the pregnancy is near term, and you should endeavor by minute precautions not to wound the uterus or to cause it to contract by the use of a too hot antiseptic liquid. The temperature after operation will probably not exceed 38° C.

When you have to deal with a slow torsion, although surgical interference is less urgent, it should nevertheless be undertaken. The operation will certainly have greater chance of success if you have not given time for adhesions to form, or if they are recent you can deal with them with far greater ease than with old and solid ones.

It is useless for me to say with what care you should perform a laparotomy. If the cyst be gangrenous, or if, in enucleating it from the iliac fossa, you rupture its walls and the contents escape into the abdominal cavity, this should be irrigated with a normal salt solution, using many litres, until the liquid runs out *perfectly clear*. The adhesions may require a few hæmostatic clamps on the bleeding points, and certain portions of the peritoneum which have been in contact with the gangrenous portion of the cyst should be wiped dry with iodoform gauze, and a concentrated solution of carbolic acid may be rapidly applied. Of course in these cases, whether rupture has occurred or not, drainage is advisable.

My favorite operation, posterior vaginal cœliotomy, I cannot advocate in cases of torsion of the pedicle, because of the numerous adhesions with which you would have to deal. The situation of the tumor as well as its much-increased size would render the vaginal route impracticable.

If, gentlemen, I have dealt at some length on this complication, it is because I felt that you should be fully aware of it, as ovarian cysts are of rather frequent occurrence, and you may some day be called upon to attend a patient presenting this complication, in which case you must know how to act without hesitation.

STERILITY FROM PERI-OÖPHOR-SALPINGITIS; PAIN AFTER OVARIOTOMY; VAGINITIS; PREGNANCY DURING LACTATION.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY PAUL F. MUNDE, M.D.,

Professor of Gynæcology in the New York Polyclinic; Gynæcologist to Mount Sinai Hospital; Consulting Gynæcologist to St. Elizabeth's Hospital.

GENTLEMEN,—This woman is twenty-five years old; she has been married nine years, and is sterile. She flows every four weeks, and her last menstruation was two weeks ago. She complains of pain in the back, headache, and dyspareunia. An examination shows quite a sufficient reason for her sterility, a condition which led me to inquire a little more fully into her history to ascertain whether there had been any previous local inflammation about the uterus. She cannot give us the desired history, but I am positive that there has been such an inflammation, for on passing my finger up into the vagina, I find the vaginal vault tense, a resistance which is not normal, and which indicates some pre-existing peri-uterine inflammation. On attempting to move the uterus from side to side, or on pulling it forward, you notice her expressions of pain. In some cases, this immobility of the uterus is due to a shallow vaginal pouch and tense ligaments, and in such cases the condition may be considered a congenital one, or due to lack of development of the ligaments. But in these cases motion of the uterus does not cause pain, and the vaginal vault has its usual elasticity. I have seen hundreds of cases where the evidences of periuterine inflammation were perfectly plain, and yet the patient knew of no such inflammation; she only knew that she had had pelvic pain. Of course, if the tubes and ovaries be bound down and dislocated by the products of such an inflammation, it is evident that there is abundant reason for the existence of sterility. This patient has no pain during menstruation, only just before it. If the ovary were

covered with these adhesions there would probably be intense pain during menstruation, but the absence of such pain here indicates that there is no obstacle to the escape of the ova from the ovary. You know it is fashionable at present to attribute every salpingitis or localized peritonitis around the uterus to gonorrheal infection of the endometrium and of the lining of the tubes, which by causing a discharge of pus from the fimbriated extremity into the peritoneal cavity gives rise to localized peritonitis. Such a condition is often present, but I hardly believe that it is the cause in every instance. It is of more value to you to be able to detect such cases as this than to be able to determine that the uterus is displaced. It is quite possible that such a condition as we find in this patient has arisen from exposure to cold during menstruation, or at other times, or even from the violence of frequent coitus, and the accompanying hyperæmia. I have no question that this patient's ovaries and tubes are in such a condition that if she complained of much pain it would be perfectly justifiable to remove them. The case is of such long standing that but little relief can be given her, except by counter-irritation with iodine, and the use of glycerin tampons and hot douches.

An examination in the Sims position shows a very small external os, and a discharge from the cervix indicating the existence of an endometritis. Cautiously introducing the sound just within the external os, you can feel that the interior of the canal is quite rough, and this is due to the enlargement of the follicles from retained secretions. The painful coitus of which this patient complains is due to the adhesions which bind down the uterus, and give rise to pain whenever the uterus is moved. An important point in the treatment consists in the separation of the patient from her husband, and the persistence in the treatment described for a period of several months. The importance of such cases as this relates to the matter of diagnosis. The woman is anxious to have children, and if, by a superficial examination, we found this "pin-hole os," and were led to consider this the sole cause of her sterility, we might be induced to divide the walls of the cervical canal and introduce gauze, and then, perhaps, for the first time, we might be made aware of the true condition of affairs by the occurrence of an acute and perhaps fatal attack of peritonitis.

CASE II.—The next patient is twenty-two years old, unmarried. She complains of pain in both sides of the abdomen. This is a case of ovarian cyst with twisted pedicle upon which I operated two years ago, and it was decidedly the most rotten ovarian tumor with which I have had to deal. The pedicle was twisted a number of times, and it was

necessary to lift the tumor out bodily with my hands, as all the forceps tore out. The patient now complains still of pain. It is well to remember that, shortly after the operation, she vowed she would not get well, and did not want to, and was very self-willed and obstinate. The pain she now complains of may be due to adhesions involving some nerve filaments. The left ovary is prolapsed. In many cases of removal of the ovaries for pain it is not uncommon for the pain to continue after the operation, and it is therefore only fair to tell the patient that the pain is liable to continue for some time, and that menstruation is also liable to continue for months, or even for several years. There has evidently been some trouble with the left ovary, for her abdomen shows evidences of counter-irritation having been applied to this region.

Some writers claim that you cannot feel the normal ovaries except under occasional and exceptionally favorable circumstances, but I say that you can usually feel them, and this case is interesting on that account.

CASE III.—Our next case is that of a woman, twenty years of age, who has been married five months. She flows every four weeks, and her last menstruation was three weeks ago. You can see the circular hymen very plainly, with a small opening in the centre. It looks very red and eroded, and, without going further into the case, I would be willing to make a diagnosis of vaginitis, probably of cervical origin. She complains of backache and headache, and there is a white vaginal discharge. The hymen clings closely around my finger as I pass it into the vagina, indicating that it has not been greatly stretched. As my two fingers are firmly gripped by it, it is not likely that she has had complete sexual intercourse. The vaginal vault is puffy and soft, but the cervix is so slender that the mobility of the uterus is limited, because there is so small a lever upon which the finger can press. The body of the uterus is slender, and lies in the normal position.

I saw recently a lady who said she had never been able to have connection with her husband. She had been married just two months. On questioning her I found she had not been unwell since just before her marriage, and on inspection, the opening of the hymen was found to be even smaller than in the patient before us. Introducing my finger into the vagina, I found on bimanual palpation that the uterus was enlarged to the size of a two months' pregnancy, and that there were other signs of pregnancy. I consider this case quite rare, as it was evident that the male organ had not penetrated into the vagina.

On examining this patient with a small speculum, you notice the roughened appearance of the mucous membrane; this is what is called "granular vaginitis," and the appearance is due to the inflammatory enlargement of the natural papillæ of the vagina. The cervix is exceedingly small; it is, in fact, an infantile cervix.

This woman can be readily cured of her vaginitis. It is best to introduce, if possible, a cylindrical speculum, and swab out the whole vagina with a solution of nitrate of silver, about twenty grains to the ounce, and then introduce a vaseline tampon. This application should be repeated every two or three days, until the mucous membrane assumes its normal color, after which, frequent applications of powdered iodoform and tannin, with a dry tampon, should be employed. You notice now, as I allow this solution to run out, that the mucous membrane has been changed from red to white; this is owing to the formation of an albuminate of silver. The patient will remove the tampon to-morrow morning, and she will be given the ordinary lead and opium wash (two to four tablespoonfuls to one quart of tepid water) for purposes of cleanliness. A small piece of cotton moistened with vaseline or cold cream should be kept between the labia. She should be very much improved after three or four applications, but it will not do to stop the treatment then; you must continue with the iodoform and tannin for at least three or four weeks.

CASE IV.—Our next patient is thirty years of age; she has been married twelve years, and has had six children, the last one eleven months ago. She is nursing now, and has not menstruated since the birth of the last child. She complains of pain in her back and in the right side of the abdomen, and she is constipated.

This case shows that ovulation takes place during lactation, for she is again pregnant about three months. My assistant reminds me that some time ago I examined the case, and found a fibroid tumor in the anterior wall of the uterus. At present the uterus is so large and soft that it would be difficult to determine such a point as this, if the patient had not been previously examined. Ordinarily, fibroids situated as this one is do not seriously complicate delivery, although they grow with the uterus during gestation. Probably after confinement, the fibroid will become involuted, just as the uterus is involuted, and this process can then be assisted by the administration of ergot.

Ophthalmology.

OPTIC NEURITIS.

CLINICAL LECTURE DELIVERED AT THE CHICAGO POLICLINIC.

BY WILLIAM H. WILDER, M.D.,

Professor of Ophthalmology in the Chicago Polyclinic; Pathologist and
Assistant Surgeon of the Illinois Eye and Ear Infirmary; Fellow
of the Chicago Academy of Medicine; Member of the
American Ophthalmological Society, etc.

GENTLEMEN,—This patient, Margaret B., is twenty-one years of age, and until two years ago has always been perfectly healthy, so far as she remembers, since childhood. Her father is still living and healthy; her mother died at the age of fifty from cancer. She has four brothers and three sisters living, in good health; one sister died in childbirth. No history of tuberculosis can be found and also none of syphilis. At the age of six she had diphtheria of the larynx, for which it was necessary to do a tracheotomy. Since then she has been in very good health, with the exception that in the last two or three years she has suffered sometimes from anæmia, for which she has been under treatment. She tells us that about four weeks ago she began to suffer from excruciating headaches, which, beginning in the left supraorbital region, would gradually extend over the top of the head, involving the whole vertex. These headaches have been constant and have continued up to the present time, although they are not so severe now as at first. Sometimes they are severe enough to deprive her of sleep. She suffers from attacks of vertigo, particularly when rising from a stooping or recumbent position. She experiences also occasional attacks of blindness, lasting from a few seconds to two or three minutes, and occurring sometimes coincidentally with the attacks of vertigo. These attacks of blindness occur many times in the course of twenty-four hours, and she says they are worse recently. Two weeks ago she noticed that her sight was failing and at present the vision in each eye is considerably reduced. At the same time she noticed that she could see double, a phenomenon that is explained at once. There is convergent strabismus of the paralytic type, occasioned, as we see, by paralysis of the external

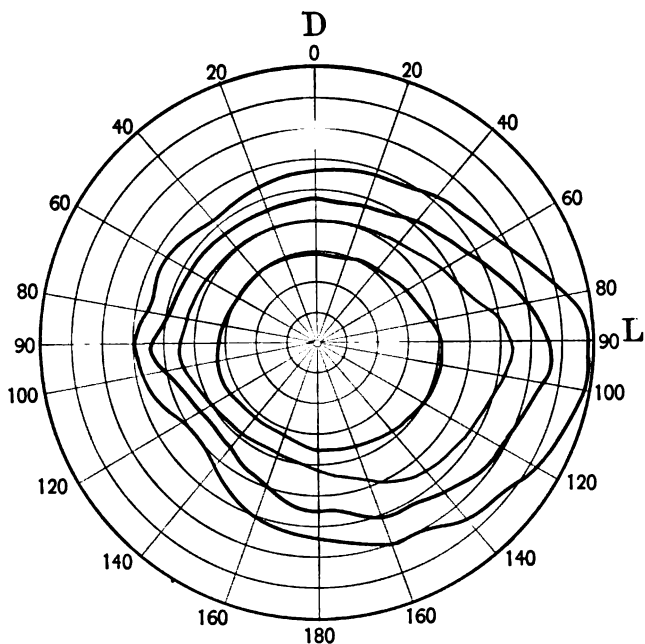


FIG. 1.—Normal visual fields for white, blue, red, and green in the right eye.

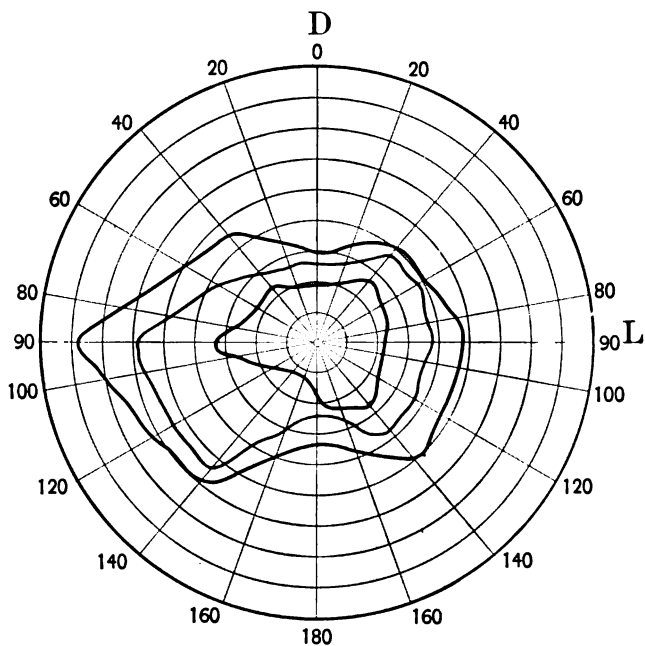


FIG. 2.—Fields for white, red, and green of the right eye of Margaret B.

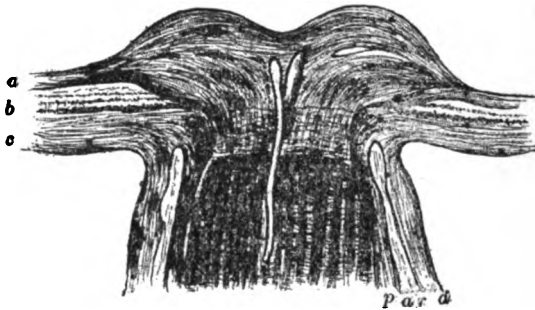
rectus of the right eye, so that in certain positions the visual axis of the eye cannot be directed upon an object, and in consequence there results diplopia. We find the vision in each eye $\frac{2}{3}$, one-third of the normal, and this is not improved by any glass we may select, thus showing us that this impairment is not due to any optical defect, such as hyperopia, myopia, or astigmatism. In connection with this decrease in vision we find the visual fields contracted. We understand by the visual field that area in which objects are visible to an eye that is looking at a fixed point directly in front of it. For example, if a person close one eye, and with the other look at some object directly in front of him, he will still be able to discern objects of a given size either side of the central object. The limits of such vision form the boundary-lines of the visual field. Thus, a healthy man is able to see towards the temporal side through an angle of 90 degrees, while on the nasal side the field is limited to 60 degrees or 65 degrees, varying according to the prominence of the nose. He will see above through an angle of 55 degrees to 60 degrees, varying somewhat according to the position of the eye in the orbit and the prominence of the eyebrows; while below this the range will be about 55 degrees or 60 degrees. This would describe the boundary-lines for a white object of a certain size, say one centimetre square. A person can perceive a red object in a smaller field than he can a white object, and he can perceive a green object in a still smaller field than he can a red object. (See Fig. 1.) The normal field for white as seen in Fig. 1 extends on the nasal side to about 60 degrees, on the temporal side to 90 degrees; below, between 60 degrees and 70 degrees; above, to 60 degrees or 65 degrees. The field for red is smaller by 10 degrees or 15 degrees than that for white; while that for green is smaller than the red by 10 degrees or 20 degrees, but nearly concentric with it. The blue field is somewhat larger than the red.

Our patient's right eye (Fig. 2) has the field for white considerably contracted. The field for red is also decidedly smaller than normal and that for green is even more constricted. There is not such a marked change in the left eye (Fig. 5), the field for white being nearly normal. There is some constriction for red and a decided contraction of the green field, which approaches to within 10 degrees of the fixation point, where it should be 30 degrees.

This patient has some symptoms of brain tumor. We have another very prominent sign of this in the swollen and inflamed optic disk. There is a condition here of optic neuritis, by which we understand an inflammation of the optic nerve, manifested by swelling and blurring

of the outlines and a congested appearance of the disk. When the inflammation of this part is more intense it is often described as papillitis, and the Germans speak of it as "stauungs papille," a term that has been translated into English by Clifford Allbutt by the expression "choked disk." In "choked disk" there is decided swelling of the optic nerve head. Its outlines become blurred, there is more or less oedema of its substance, and also of the surrounding retina, while the vessels appear markedly engorged. (See Fig. 3.) There will sometimes be hemorrhages in the neighboring retina or the swollen optic

FIG. 3.



Longitudinal section through the head of the optic nerve, showing choked disk. The optic disk is swollen and the vessels are engorged: a, the retina; b, the choroid; c, the sclera; d, the dural sheath; p, the pia sheath; ar, the arachnoid space.

disk. There is some reason for a clinical distinction between optic neuritis and choked disk, because of the different appearances of the two conditions, but pathologically considered they are identical, the latter being only a more intense form of inflammation characterized by greater swelling of the disk. There are several theories to account for this condition in brain tumor. The oldest is that of Von Graefe, who believed the trouble to be caused by increased intracranial pressure which occasioned compression of the cavernous sinus, and so led to the disturbance of the circulation of the eye manifested by the congestion of the vessels at the optic nerve head. This theory at one time was very generally held, but it has been given up for others that are more plausible. A later theory is that elaborated by Schmidt and Manz and relates to the lymph-spaces of the optic nerve. Manz observed the common occurrence of distention of the arachnoidal space of the optic nerve in cases of intracranial growths or in disease of the encephalon in which there was increased pressure or an augmented quantity of arachnoid fluid. Schmidt demonstrated by experiment

that colored fluids injected into the sheath of the nerve or into the sub-arachnoid space passed into lymph-spaces at the lamina cribrosa, and argued that, inasmuch as we find many cases in which this sheath is markedly distended in brain tumor, therefore the optic neuritis was due to distention of the sheath, compression of the nerve, and interference with the circulation, giving rise to congestion, enormous distention of the vessels, and great swelling of the optic disk. This is a beautiful theory, and it agrees with the facts in some but not in all cases. Many cases of brain tumor have been examined in which there was no distention of the optic sheath. Then, again, we find cases in which there is markedly increased intracranial pressure, as in cases of hydrocephalus, in which there is no swelling of the optic disk. So the theory is far from being absolute, although it has a great many adherents.

A third and more plausible explanation of this condition is that advanced by Leber. He thinks that the products of tissue-change in intracranial tumors as well as tuberculosis, passing with the cerebro-spinal fluid into the optic nerve sheath, enter the lymph-channels at the lamina cribrosa and thus act as an irritant to excite inflammation there, an optic neuritis being in every sense a true inflammation.

Now as to the frequency of this condition of optic neuritis in brain tumors. Annuske and Reich in 1873 and 1874 collected eighty-eight cases of brain tumor in which autopsies had been made, and found that optic neuritis was present in eighty-four, or something like ninety-five per cent. ; but the criticism of Gowers with regard to their statistics is probably a just one: that, in all probability, this percentage was high, because the novelty of ophthalmoscopic examinations was the reason for a larger proportion of cases with optic neuritis than without it being published. Gowers's experience leads him to state that optic neuritis occurs in, at least, eighty per cent. of brain tumors. Edmunds and Lawford, in a series of one hundred and seven fatal cases, found neuritis in sixty-eight, or sixty-three and one-half per cent.

Not long ago I examined the histories of cases of intracranial tumor published in a period of four years, and selected from them only those in which the diagnosis had been confirmed either by an operation or an autopsy. I obtained in this way reports of one hundred and sixty-one undoubted cases of neoplasm within the skull. Twenty-one of these were useless for my purpose, as no record had been made of the condition of the eye. Of the remaining one hundred and forty it was distinctly stated that one hundred and four had optic neuritis, while of the other thirty-six it was reported that no optic neuritis was present at the time of the examination. This gives a percentage of 74.3.

This might have been somewhat greater if more frequent examinations had been made of those cases in which no optic neuritis was found, for this sign is sometimes absent during the greater part of the course of the case to develop a short time before death.

You will perceive on ophthalmoscopic examination of the patient that the optic disk is swollen, its boundary-lines almost obliterated, and the veins markedly engorged. Small retinal hemorrhages are also to be seen in the neighborhood.

New connective tissue is formed in and around the optic disk as a result of the inflammation, and with the subsidence of the neuritis there follows a contraction of this new tissue and an atrophy of the nerve, giving the disk a whiter look than normal and an appearance as if it had been filled in with a soft felty substance. Such an appearance is quite characteristic of the atrophy following optic neuritis, and enables us in many cases to differentiate this condition from an atrophy consequent upon a descending degeneration of the nerve-fibres, as you will see in the third patient. Next to tumors of the brain, meningitis and abscess of the brain are the most frequent causes of optic neuritis.

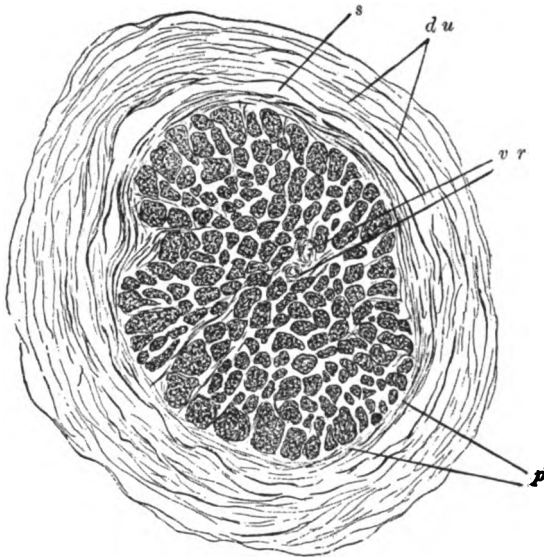
Syphilis also plays a prominent rôle in causing this affection, either by attacking the nerve directly or by means of exudations or gummatous deposits in the orbit. Certain febrile diseases, as scarlatina, typhoid, measles, grippe, and others, may also give rise to optic neuritis. Certain diseases causing disturbances of nutrition, such as Bright's disease and diabetes, may produce inflammation of this nerve. Again, certain blood states, such as anæmia, pernicious anæmia, and leucocythæmia, may be accompanied by more or less marked inflammation of the optic nerve.

This patient, John C., thirty-three years of age and married, has always been healthy, with the exception that about four years ago he had an attack of acute rheumatism. There is no history of syphilis, tuberculosis, or injury. He uses tobacco moderately and never has been a drinker. About five weeks ago, December 7, he noticed he could not see well with the left eye, this partial blindness coming on quite suddenly. When he first came to us, a few days later, we found the vision of the left eye was reduced to the ability to count fingers at nine feet. The vision of the right eye was normal. Gradually his vision improved, so that on January 4 he could see $\frac{20}{200}$, and on January 7 he could see $\frac{20}{80}$, or one-fourth the normal vision. The sight of the right eye has remained perfect, and we find on examining it now that R. V. = $\frac{20}{20}$. The left eye shows a further improvement, as L. V. = $\frac{20}{40}$.

In this case we probably have to deal with an inflammation of the

orbital part of the optic nerve, which in its course has found expression in the optic disk. As you will see on ophthalmoscopic examination, the disk is slightly swollen and congested, its outlines are somewhat blurred, and the vessels are distended, although not nearly to the extent seen in the preceding case. We find on further examination a marked change in the visual field of the left eye. (See Fig. 6.) There is a contraction of the field for white as well as those for colors, and in addition there is a well-defined scotoma or blind spot in the centre of the field for red and green. That is to say, when the patient is looking directly at a small green or red object, a card one centimetre

FIG. 4.

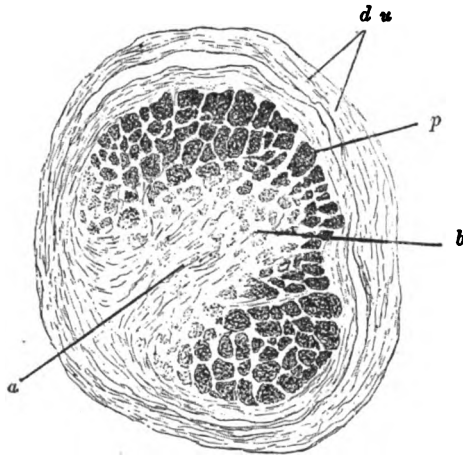


Cross-section of healthy optic nerve about five millimetres behind the eyeball. Magnified eighteen diameters: *du*, dural sheath; *p*, pial sheath; *s*, subdural space; between the dural and pial sheaths are seen fibres of the arachnoid; *vr*, central vessels; stained with Weigert's hæmatoxylin.

square, he is unable to distinguish the color, although he can see the form. The chart shows the boundary of the area within which he is blind for these colors. In the rest of the field inclosed in the red and green lines his color sense is approximately normal. This blind spot for red and green is somewhat larger than it was at the first examination, although the visual acuity for form has improved. We have in this condition of the visual fields one of the prominent signs of an inflammation of the optic nerve, which, originating in that part of it that lies behind the eyeball, is called retrobulbar neuritis. In such

cases as this we can assume that some parts of the nerve suffer more than others, and examination has shown that in those presenting a central blind spot the inflammation attacks most severely the bundles of fibres situated in the middle and in the temporal side of the nerve. This is very well illustrated in the preparation under the microscope showing a transverse section through such an optic nerve. (Compare Fig. 4 with Fig. 7.)

FIG. 7.



Cross-section of optic nerve about one millimetre behind the eyeball. Magnified fifteen diameters. The section is stained with Weigert's hæmatoxylin, which stains the healthy nerve fibres black, as seen in the upper and lower parts of the specimen (and also in Fig. 4), while the atrophied portions of the nerve (*a*), like the connective tissue of the sheath, are colored a light yellowish brown. At *b* are seen bundles of fibres that have undergone partial atrophy; *du*, dural, *p*, pial sheath.

This is particularly true of cases of chronic retrobulbar neuritis occasioned by tobacco- or alcohol-poisoning, in which the fibres that supply the region of the macula lutea are attacked, giving rise to a failure of central vision and a scotoma for red and green, although the peripheral vision usually remains unimpaired. In other and more severe cases of neuritis the whole nerve may be affected and total blindness may result, as you will see in the next patient. The disease manifests itself in acute and chronic forms. Our cases to-day are examples of the former.

Acute retrobulbar neuritis is, fortunately, usually unilateral, a point of difference between it and optic neuritis occasioned by encephalic lesions, which is most frequently bilateral. The onset is usually sudden, and may make itself felt by headaches and deep-seated pain in the

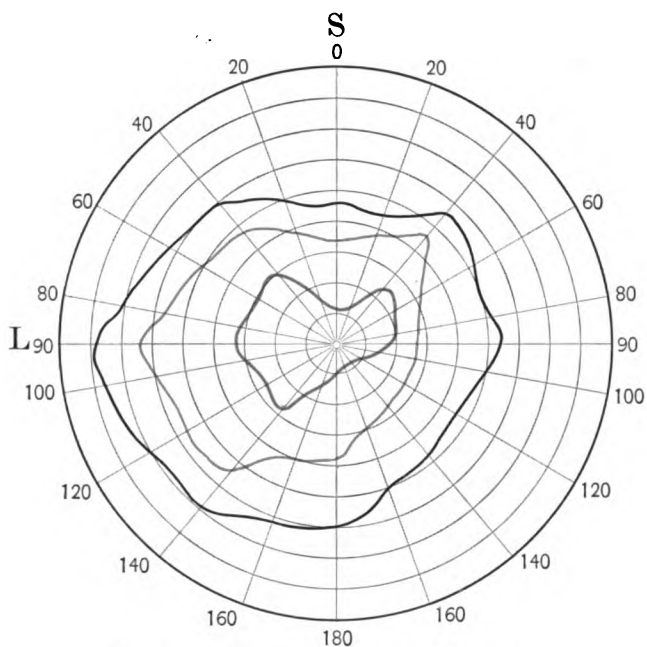


FIG. 5.—Visual fields of the left eye of Margaret B.

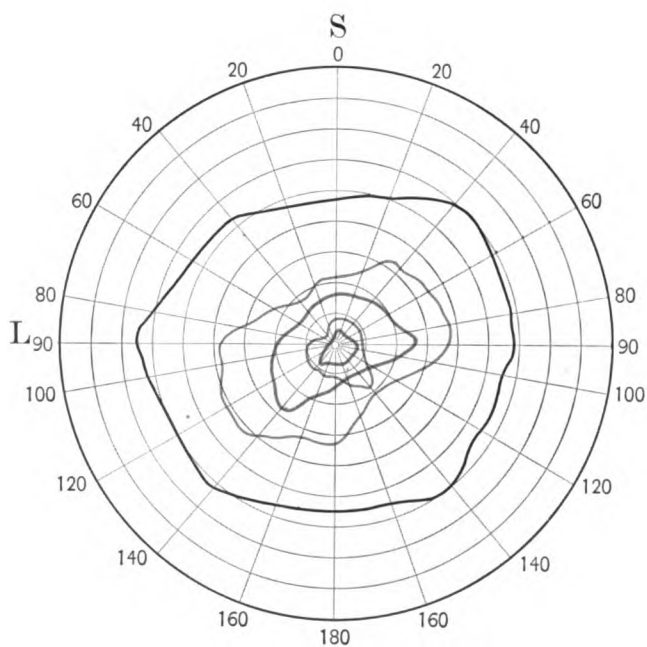


FIG. 6.—Left eye of John S. Contraction of all fields with central scotoma for red and green.

orbits, aggravated by movements of the eyes or pressure upon the eyeballs. This symptom was absent in the case before you, but, as we shall see, was prominent in the case I shall next present. But the most noticeable symptom is the rapid failure of vision which in a few days, in severe cases, may be reduced to almost nothing. In the case of our patient, the vision of the left eye was so impaired in a few days that he was only able to count fingers at nine feet. In severe cases, without treatment, there may be no recovery, and atrophy of the nerve supervenes. In this connection let me present this patient:

Helena K., aged thirty-nine; married; mother of four children; has always had good health. No history of syphilis, nor of any severe illness. Never suffered from an injury to the head and knows of nothing that could have caused the trouble with her eye. She states that four years ago, after crying a great deal over some domestic troubles, she experienced severe pain in the right eye and orbit, accompanied by headache. In a day or two she noticed that the right eye was completely blind. I did not see her until a short time ago, when I found the condition that you will now observe.

R. V. = perception of hand held a few inches from face.

L. V. = $\frac{3}{4}$. The right optic disk is grayish white, its outlines are sharply defined, and it contrasts strongly with the red background of the fundus. It is somewhat sunken below the level of the choroid, and in the centre you will notice the mottled appearance given to it by the lamina cribrosa. All this is very characteristic of an atrophy of the optic disk consequent upon a descending degeneration of the nerve fibres.

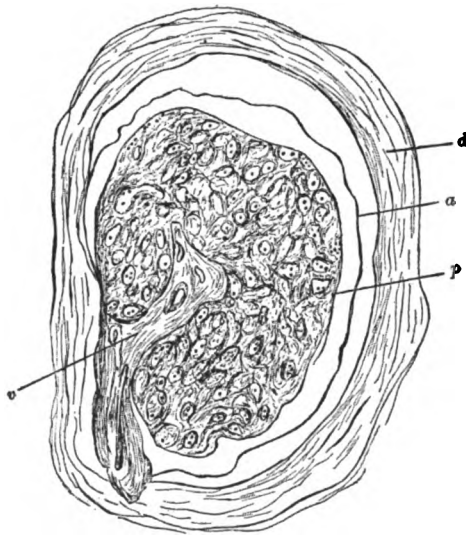
Here we have to do with a case of retrobulbar neuritis coming on very suddenly and with such severity that almost complete atrophy of the nerve supervened. This process is well illustrated by the slide under the microscope, bearing a section of an atrophied optic nerve, in which you will see that the bundles of nerve fibres have been replaced almost entirely by connective tissue. Here and there a few fibres may be seen that have escaped; these are seen as black points. (Fig. 8.)

The causes of acute retrobulbar neuritis are quite numerous. Certain acute febrile diseases, such as typhoid, measles, influenza, and others, have been known to give rise to this trouble. Exposure to severe cold is sufficient at times to cause such a neuritis. Great physical exertion has been given as a cause by no less an authority than Fuchs, who records a case of a young man, who, for a wager, rode a long distance on a bicycle and the next day was attacked by a bilateral optic neuritis. An injury to the nerve in the orbit either by pressure from

extravasation of blood or a tumor is sufficient to light up a retrobulbar neuritis. The only apparent reason we can assign for its occurrence in the last patient is the disturbance of the circulation produced by the violent weeping. Some cases have been described depending upon an inherited tendency ; syphilis is also accountable for some. Finally, we are forced to describe certain cases as idiopathic, and in this category we shall have to place our second case.

The chronic form which generally affects both nerves is caused by certain poisons, and chief among these is nicotine. The excessive use of tobacco causes, as I mentioned before, an inflammation of the nerve

FIG. 8.



Cross-section of atrophied optic nerve about two centimetres behind the eyeball. Magnified fifteen diameters. The nerve has been transformed into connective tissue, but here and there can be seen a few fibres that have escaped the degenerative process. These have taken the stain of Weigert's hæmatoxylin, and are black : *d*, dural sheath ; *a*, arachnoid ; *p*, pia sheath ; *v*, point of entrance of central retinal vessels.

bundles supplying the yellow spot. Alcohol also causes a similar disturbance. Lead-poisoning is more likely to bring on an acute than a chronic form of the disease. Quinine, bisulphide of carbon, salicylic acid, and other drugs have been found to cause optic neuritis when taken in excessive doses.

The treatment consists in correcting the morbid condition that has given rise to the neuritis. If the trouble is recent we may hope to accomplish good by the use of diaphoretics, leeches, applied either to the temple or at the mastoid, absolute rest of the eyes, and remedies

such as potassium iodide and mercury to hasten resorption of exudates or extravasations in or about the nerve. If this is not promptly accomplished, more or less atrophy of the nerve, against which we are powerless, will result. The microscopic specimens will show you the appearance of a cross-section of a healthy nerve as well as some that have undergone atrophy. The sections are colored with Weigert's hæmatoxylin, which imparts a deep black stain to all healthy nerve fibres, but leaves those that have undergone degeneration and atrophy a yellow color like the surrounding connective tissue.

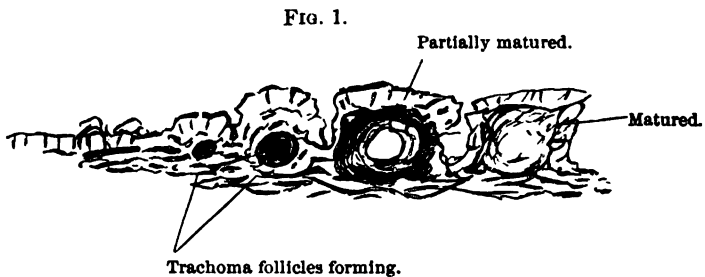
TRACHOMA CASES.

CLINICAL LECTURE DELIVERED AT THE CHICAGO POLICLINIC.

BY J. ELLIOTT COLBURN, M.D.,

Professor of Ophthalmology in the Chicago Policlinic.

GENTLEMEN,—It is my good fortune to be able to present to you for study four cases of trachoma that have been under observation for some weeks, and two cases that come fresh to the clinic. Very luckily for us, they have had no previous treatment. I have arranged them in the order in which we can best study such cases, according to the stage of the disease in which each case happens to fall. Before we begin the study of these cases it will be best to consider the pathology of trachoma. (See Fig. 1.)

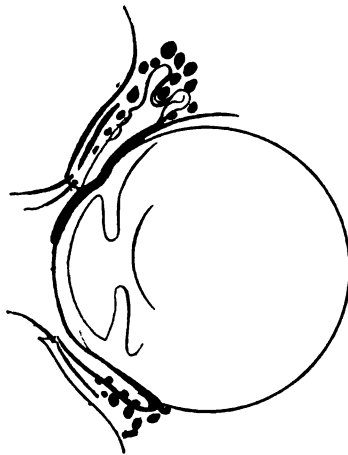


As far as we know, it is an infiltration of lymph-like cells in the conjunctival tissue, causing hypertrophy of the normal papillæ, and aggregating in the subconjunctival tissue, resembling in its early stage glandular structures or follicles. These infiltrations invade the retro-tarsal fold, the palpebral conjunctiva, cornea, and, in rare cases, the ocular conjunctiva. Trachoma follicles in appearance and history are like adenoid formations in any portion of the mucous membrane. (See Fig. 2.) It is an infectious disease, and is probably due to a micrococcus. The disease may be communicated by any means that would allow the transference of the dried or moistened secretion directly or

indirectly from a trachomatous eye to another. In schools, lumber camps, asylums, etc., it is liable to become epidemic.

CASE I.—A school-girl, aged sixteen years, comes to us on account of asthenopia, with puffiness about the eyes and drooping of the upper lids. Exposure of the conjunctiva of the lower lid shows the tarsal conjunctiva to be slightly roughened and covered by mucous strings; the retrotarsal conjunctiva is much thickened and studded with small yellow and red tumors bathed in gray mucus. The upper lid (tarsal conjunctiva) is smooth but slightly flushed; just at the superior border

FIG. 2.



Trachoma deposits.

there are numerous, deeply-buried, reddish-yellow masses, and at the very edge numerous little rough projections. An eversion of the retrotarsal conjunctiva with exposure of the fold reveals large masses of hypertrophied tissue and soft-looking follicles.

We have already made frequent instillations of cocaine, and will be at once able to press out the centre of the softened follicles. As a rule, I prefer to use my thumb-nail for this purpose, because I can best estimate the resistance of the follicles and judge of the amount of pressure requisite to empty them. For operating in the external canthus and the emptying of such follicles as are not reached by the thumb, we can use small curved forceps with blades smooth and strong and edges just a little dulled. In this way we can go over the whole retrotarsal fold.

We will now deluge the eye with a hot solution (110° to 120° F.) of boracic acid, throwing the solution with as much force as we can

against the conjunctiva, avoiding the cornea. For this purpose I use a pipette with small aperture and large bulb. With this instrument you can direct the stream with force and accuracy against the conjunctiva.

The patient is now instructed to apply cold cloths to the eyes for ten minutes at a time, three times a day.

CASE II.—A young mechanic, aged twenty-one, presented himself first for treatment two weeks ago. The appearance of this case at the time of the first visit was essentially the same as that of the patient just examined, and our treatment has been that just given that patient.

During the past two weeks we have emptied three follicles not ruptured at the first sitting, and have stimulated the absorption of unformed and immature follicles by friction, with boracic acid applied with gauze drawn over the tip of the index-finger. You will see here, in the lower lid, two or three rough-looking patches of papillary enlargement; these have buried beneath them some small unformed follicles. All the remaining conjunctiva is resuming a normal appearance, and the secretions are becoming healthful in character. Frequent inspection is necessary for from two to six months after the case is apparently cured, fully to protect the eye from further infection from some single mass that has escaped treatment.

CASE III.—A man, aged twenty-seven years, says that his eyes have been sore and under treatment for two years. We have had him under observation about six weeks. The vision is much impaired, cornea vascular, and the pericornea covered by minute elevations from which upon pressure we are able to force out the contents,—a soft, gray-white particle. Most of these elevations are not mature enough to discharge their contents, or are in the process of being absorbed. The cornea has been in its present state for about two years, having had repeated ulcers and attacks of superficial inflammation.

Upon exposing the conjunctiva of the upper lid, you will see that we have a markedly different condition to deal with: towards the palpebral margin it is but slightly rough and has no marked elevations; higher up, however, there are large papillary elevations and deep furrows. This condition extends to the retrotarsal region. Upon exposure of this fold we find deep furrows and some full follicles which empty upon slight pressure. Towards the outer canthus you see some hard reddish follicles which refuse to rupture. We shall apply the forceps and crush them. To the tarsal part of the lid we apply friction with gauze drawn over the finger and dipped in amorphous boracic acid powder and rubbed over the lid with gentle;

firm pressure. The retrotarsal fold is exposed and the powder applied in the same way.

Treatment will be given once in two to ten days, just frequent and forcible enough to stimulate the absorption of the morbid products.

This method of stimulation recommends itself on account of the safety of the cornea from irritation, the massage reaching only the parts diseased and in no way irritating the cornea. Under the caustic treatment the cornea, even though it be carefully protected from the excess of nitrate of silver, sulphate of copper, etc., when exposed to the cauterized lids or to the overflow of these fluids, becomes irritable, and the already macerated cornea may become necrotic and ulcers may form.

CASE IV.—A man, aged thirty-four years, has been three months under observation. He worked in a lumber camp two years previous to his first visit to our clinic. In the beginning of the lumber season, one man in the camp was noticed to have inflamed eyes, and was soon forced to stop work on account of corneal ulcers. Before the close of the season nine out of forty men had inflamed eyes,—our patient among the others. From the history I should judge that the laborers were infected from the one case, illustrating the danger from infection.

This case had at the time of his first visit all the characteristics of the disease. Our treatment was expression and antiseptics, and friction with carbolated or borated gauze. The improvement has been rapid. There are no evidences of the disease upon the cornea excepting a slight nebula where a pannus of great density disturbed the epithelial layer. The retrotarsal fold has much scar tissue, and the secretion of mucus is rather scanty.

Two months after his first visit our patient was able to go to work. For some months it will be best to use a slightly stimulating collyrium, and for this purpose I shall advise the solution of—

R Sodæ biborat., gr. x;
Glycerinæ,
Aquæ camph.,
Aquæ dest., aa ʒss. M.

or,

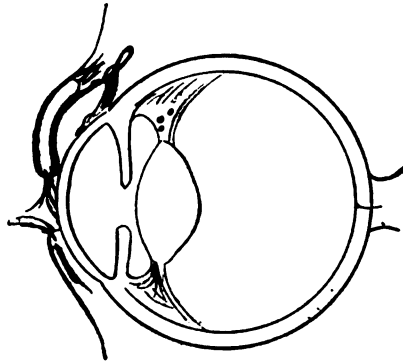
R Zinci sulphat., gr. ii;
Aquæ rosæ, ʒ i. M.
Sig.—Two or three times a day.

The remaining cases are really the sequelæ of trachoma, giving in one case a history of seven years, and in the other nine or ten years.

For four years they have been wholly incompetent to work, corneal ulcers, keratitis, blepharospasm, etc., filling in the greater part of the second year.

They come now for relief from the irritation of the cornea due to the incurving of the tarsal cartilage (entropium), causing the lashes to constantly sweep the cornea. (See Fig. 3.)

FIG. 3.



Entropium.

Exposure of the tarsal conjunctiva shows an atrophied mucous membrane traversed in all directions by narrow bands of cicatricial tissue, the membrane being dry and glistening. The aperture of the lids has become narrowed, the lids drawn tensely over the cornea, and being dry, the irritation of the scarred surface is great. Here, again, we can use zinc sulphate or the glycerine solution for the relief of the dry and irritating lids.

The treatment referred to for the relief of these cases will be some operation for the cure of the entropium (the procedure which I prefer is the one suggested by my colleague, Professor Hotz), and an operation for the relief of the narrowed aperture,—canthoplasty.

A summary of our management of cases of trachoma, so far as the treatment of the disease itself is concerned, may be arranged as follows :

First, cleanse the conjunctiva with boracic acid solution. Second, instil five drops of a five-per-cent. solution of cocaine, and after five minutes evert the upper lid, direct the patient to look downward, pass a small pledget of cotton that has been saturated with cocaine solution up into the retrotarsal region, and allow the lid to revert, when the pledget will be carried in to the upper part of the fold. In fifteen minutes the lid can be handled freely with but little pain ex-

cept on deep pressure. Or, if your patient will not submit to the pain of the operation modified as best we can by the use of cocaine, administer a general anæsthetic. You can now choose between the forceps suggested by Dr. Prince and the roller forceps used by Knapp. If these are not to be had, the thumb- and index-finger-nails can be used for making the pressure necessary to empty out most of the follicles, and this procedure supplemented by the use of forceps for the isolated spots. I also find that firm pressure applied with enough force to rupture immature follicles, and yet not violent enough to crush the normal tissue, will cause rapid absorption of the trachoma deposit and leave no cicatrix.

After rupturing and expressing the follicles, we apply the amorphous powdered boracic acid with gauze. If there is any tendency to pannus or pericorneal irritation, it will quickly disappear. If there are corneal infiltrations, they may be absorbed, or, if softening has begun, the follicles may be ruptured and thoroughly drenched with a hot solution of boracic acid, or cauterized with a point made by spinning a small flake of surgeons' cotton on a toothpick, the point of cotton saturated one-third of its length with ninety-five per cent. carbolic acid. The point should be just large enough to fill the opening of the ulcer. When cocaine has been used the application is not painful and the after-effect is sedative.

Applications of sodium biborate solution, from three to six times a day, are salutary and agreeable.

The prognosis is always grave, even in cases under the observation and treatment of the most competent men, and living in the most favorable conditions. The great danger lies in the extension of the infection to the pericornea and cornea.

Thorough surgical treatment of trachoma materially shortens the duration of the disease, and if taken early does away with the most serious sequels.

The actual time occupied in the cure of trachoma by recent methods varies from four to twelve weeks. The lids should be inspected, however, once a month for from six to twelve months after apparent cure.

Laryngology, Pharyngology, Rhinology, and Otology.

TWO CASES OF DISEASE OF THE MIDDLE EAR, WITH REMARKS ON THE ANATOMY OF THE MASTOID ANTRUM.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY COLLEGE HOSPITAL.

BY RICKMAN JOHN GODLEE, M.S., F.R.C.S.,

Surgeon to University College Hospital, London.

GENTLEMEN,—It is a commonplace, not confined to our profession, that those who have the greatest amount of book-learning are often least capable of putting it into practical application. This truism applies with great force to that class of diseases of which I wish to bring two examples before your notice. A man may have at his fingers' ends the minutest symptoms that have been described as characteristic of meningitis, and may know the last word about cerebral abscess and lateral sinus thrombosis, but yet, when he is brought face to face with a case in which perhaps two or three of these conditions are combined, or, what is more likely, where there is only suppuration of the antrum, he may find his powers of diagnosis seriously at fault. I have written down some tables (in the compiling of which I am much indebted to Macewen's lucid descriptions)¹ showing the most characteristic symptoms of the various conditions which may be expected or feared as consequences of chronic purulent inflammation of the middle ear. I will read them through; but how can any ordinary brain be expected to retain even a few of these details, much less the long and elaborate, even if lucid, descriptions of the numerous authors who have written on the subject?

MASTOID SUPPURATION IN CHRONIC OTITIS MEDIA.

1. Stoppage of the discharge frequent.
2. Pain in ear, often extending to the whole of one side of the head.
3. Tenderness, swelling, and œdema of the mastoid process often present, sometimes absent.

¹ Pyogenic Infective Diseases of the Brain and Spinal Cord, by William Macewen, M.D., Glasgow, 1898.

4. High temperature.
5. Rapid pulse.
6. Vomiting.
7. Not infrequently a rigor.
8. It is said that optic neuritis may occur.
9. Enlargement of the cervical glands may occur.
10. Mental state not necessarily affected.

LATERAL SINUS THROMBOSIS IN CHRONIC OTITIS MEDIA.

1. Stoppage of the discharge frequent.
2. Pain in ear extending to whole of one side of the head.
3. Tenderness on percussion of mastoid process; œdema over mastoid may occur, but is not very marked.
4. High temperature with marked fluctuations.
5. Rapid pulse.
6. Vomiting.
7. Rigors common.
8. Optic neuritis may occur.
9. Sensation of fulness due to thrombosis of the tributaries of the lateral sinus; thrombosis of internal jugular vein.
10. Enlargement of the cervical glands common.
11. Cervical abscess arising from thrombosis of the internal jugular vein.
12. Pulmonary complications.
13. Enteritis.
14. Mental state not necessarily affected.

SEPTIC MENINGITIS IN CHRONIC OTITIS MEDIA.

1. May be associated with stoppage of the discharge.
2. Pain in the frontal or temporal region, very severe.
3. Temperature persistently high.
4. Rapid pulse.
5. Rigors not common. If they occur they suggest pyæmia.
6. Optic neuritis may occur.
7. Mind clear at first; irritability, later excitement, hypersensitiveness, and agitation; delirium at last.
8. Chronic or tonic spasms associated with or alternating with paresis, especially affecting the neck and the upper extremities.
9. Squint common.
10. Retraction of the head (when sigmoid sinus is affected).

11. Course rapid, usually not longer than a fortnight.
12. Emaciation.

CEREBRAL ABSCESS IN CHRONIC OTITIS MEDIA.

There may be stoppage of the discharge. The symptoms are divided into three stages.

First period, lasting from twelve hours to a week.

1. Pain in ear, temporal region, and forehead. Occasionally shooting pains. It is severe, continuous, or remittent. It is said that it may be on the side opposite to the diseased ear.

2. Temperature slightly above normal.

3. Pulse slightly more frequent than normal.

4. Vomiting.

5. A rigor is common, frequently more than one. If there be many, pyæmia is probably present.

6. Optic neuritis may be commencing.

7. Mental state not necessarily affected.

Second period.

1. Pain less but still present, patient sometimes moans with it.

2. Percussion may elicit pain.

3. Temperature normal or low.

4. Pulse slow and full; sometimes weak.

5. Respiration slow.

6. Dulness of intellect, slow cerebration, difficulty of fixing the attention and making any effort.

7. Constipation

8. Loss of appetite.

9. Retention of urine.

10. Sometimes vomiting.

11. Convulsions uncommon; if they do occur they will help to localize the abscess.

12. Paralysis very important if it should occur; but it may be absent.

13. Fætor of breath.

14. Emaciation.

15. Optic neuritis, usually not going on to atrophy.

Third period.

1. Deepening coma.

2. Temperature, pulse, and respiration still below normal.

3. Abscess may burst through the cerebrum, giving signs of meningitis.

4. Or it may burst into the ventricles, giving rise to (a) widely dilated pupils; (b) hurried respiration; (c) livid face; (d) quick pulse; (e) high temperature; (f) twitchings and convulsions; (g) coma.

What is required in these days of manifold refinement and multiplication of detail is something like the pictures and posters of our *fin-di-siècle* artists, who with a few lines and two or three colors succeed in giving an impression which, though it may possibly be somewhat caricatured, tells its tale vividly and unmistakably. Such a description in flat tints would be extremely useful; the smaller facts would naturally fall into place in the same way as the minor detail is unconsciously imagined in looking at the work of a truthful impressionist.

It might be attempted in this case by taking the common symptoms and stating how they occur in each of the conditions we have been discussing,—thus:

1. *Temperature*.—(a) Mastoid suppuration, high; (b) lateral sinus thrombosis, high with great variations; (c) meningitis, persistently high; (d) cerebral abscess, slightly raised at first, then subnormal.

2. *Pulse*.—Rapid, except in cerebral abscess.

3. *Respiration*.—Unaffected, except when intracranial mischief is present, when it may be slow or Cheyne-Stokes.

4. *Rigors*.—A single rigor may usher in the commencement of either condition. Repeated rigors suggest lateral sinus thrombosis.

5. *Mental State*.—Unaffected, except by intracranial mischief. Dulness and slow cerebration suggest abscess. Excitement suggests meningitis; the latter succeeding the former suggests an abscess rupturing onto the surface or into the ventricles.

6. *Vomiting*.—Suggests intracranial mischief.

7. *Pain*.—Local pain suggests mastoid disease. Severe and more or less continuous pain suggests lateral sinus thrombosis or meningitis. Severe pain followed by abatement of the pain suggests cerebral abscess.

8. *Tenderness*.—Suggests local and superficial mastoid suppuration; pain elicited by percussion suggests lateral sinus thrombosis. In meningitis and abscess pain is very likely absent.

9. *Abscess*.—Suggests mastoid suppuration or lateral sinus thrombosis. In the former case the swelling is over the mastoid; in the latter, it may be behind it or in the neck.

10. *Glandular Enlargement*.—Suggests mastoid suppuration and lateral sinus thrombosis.

11. *Clotting in Jugular Vein*.—Only a sinus thrombosis.

12. *Optic Neuritis*.—Strongly suggests intracranial mischief, without excluding other conditions.

13. *Paralysis, Retention of Urine, and Stubborn Constipation.*—Suggest cerebral abscess.

14. *Spasms, Tonic or Clonic.*—Strongly suggest meningitis.

15. *Rapidly Fatal Course.*—Suggests meningitis.

16. *Chronic Course and gradually deepening Coma.*—Suggest cerebral abscess.

17. *Other Obvious Signs of Embolic Pyæmia.*—Suggest sinus thrombosis.

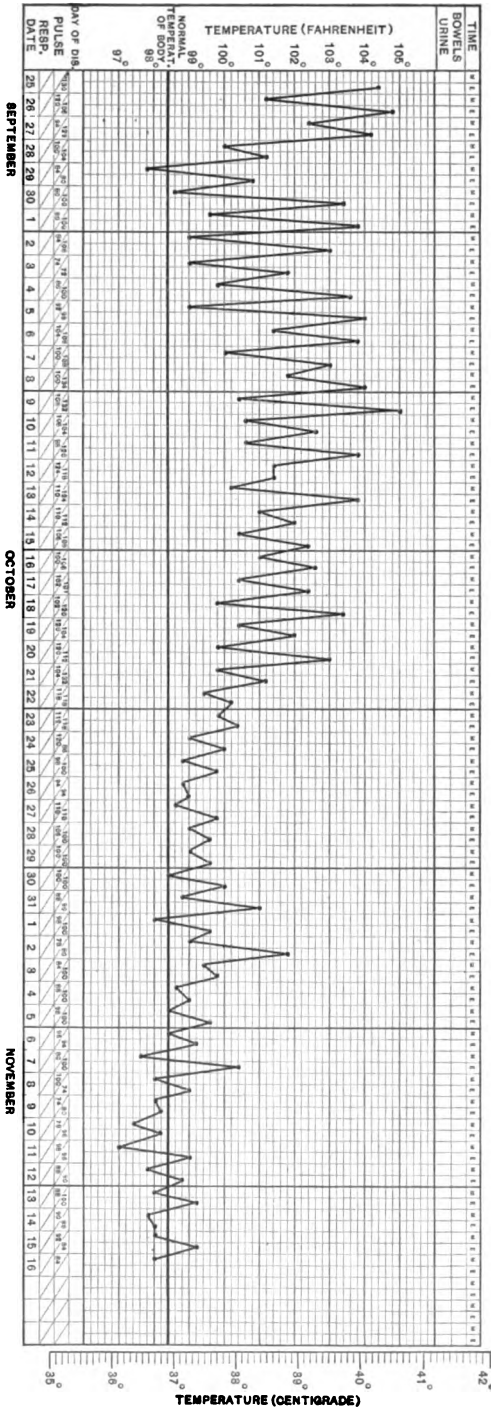
It is difficult to keep such a meagre table as this within reasonable bounds, or to make it even approximately accurate; and when it is considered that not only does mastoid disease—more or less acute—almost invariably precede the others, but that all the possible permutations and combinations of the four conditions may be met with, and that these again may be complicated by the presence of altogether independent diseases, such as syphilis or ague, it is easy to appreciate the difficulties of diagnosis that almost invariably arise.

We had not very long ago a patient in the ward who was admitted after his cerebral abscess had burst into the ventricles, and who rapidly developed the maniacal excitement characteristic of this condition. You have seen others where prolonged and severe headache with high temperature and sometimes vomiting have depended upon disease of the mastoid only. It is to this latter class that the first of the two cases I wish specially to refer to essentially belongs; but it must be assumed that there was superadded some pyæmic condition which caused the inflammation of the hip-joints. The real interest of the case centres on this fact. We could not account for the subsidence of the local symptoms while the high temperature was maintained; but ultimately first one hip-joint and then the other became affected, and then the inflammation rapidly subsided and the child became convalescent.

E. B., a delicate-looking girl, seven years of age, was admitted into University College Hospital on September 25, 1895. She had for some time been liable to attacks of earache, sometimes on one side, sometimes on the other. On the 21st of September she was seized with earache on the right side. On admission her temperature was 104.6° F. and her pulse 130. The mastoid process was slightly tender, the meatus was red and swollen and contained some offensive pus. The membrane bulged, and on the 27th it was incised, with apparently some relief.

A glance at Chart I. will explain the wide excursions which occurred in the temperature. The child in the mean time, though ob-

CHART I.



Temperature chart of a girl of seven with disease of the mastoid antrum.

viously emaciating and taking but little food, remained, comparatively speaking, bright, and there was no disease of the optic disks.

On September 27 I opened the antrum, which contained a little pus, and the surrounding bone was very dense.

On September 29 the child vomited three times.

On October 3 I opened up the mastoid process freely and found that many of the cells contained pus. The lateral sulcus was opened up for an inch and was found to contain pus. The sinus was healthy.

As the child did not mend, I explored the middle fossa on October 10, and opened up the cavity of the tympanum more freely. The lateral sinus was found to be still healthy.

On October 12 there were signs of acute inflammation of the right hip-joint. On October 14 there were equally clear signs of acute inflammation of the left hip-joint.

Nothing was done in the way of fixing the hips, and in the course of a few days the pain and limitation of movement gradually disappeared. Coincidentally with this there was a gradual fall of temperature and a return to health, so that by the end of October the child was practically convalescent, and by the middle of November she was sent to the country with nothing but a small granulating wound behind the ear.

Very different was the next case, in which the great difficulties in the diagnosis delayed suitable treatment, and in which, even after the post-mortem examination, it was difficult to trace the probable course of events. You will observe that, though there was old middle-ear disease on the left side, the pain and important mischief were on the right; and that, though certainly many characteristic symptoms of lateral sinus thrombosis in time declared themselves, those of meningitis were, at all events until near the close of the case, remarkable by their absence; while the slow pulse and gradually-increasing mental inactivity were enough to suggest the possibility of the presence of a cerebral abscess.

E. W. H., aged forty-nine, was admitted to University College Hospital September 4, 1895. When twenty-three years old he had been struck on the left side of the head by a falling brick, in consequence of which he kept his bed for six weeks. Since then he had been almost completely deaf on the left side, and had been subject to a more or less continuous discharge from that ear.

In May, 1895, he began to suffer from pain on the right side of the head and to be deaf in the right ear. These symptoms became worse, and the pain kept him awake at night. He gave up work on August 25. He suffered from giddiness for a fortnight before admission.

On admission his symptoms consisted of, first, deafness and discharge on the left side; second, frontal headache, most marked on the right side; third, indistinctness of the optic disks, most marked on the left side.

The temperature was about 99° F. and the pulse about 70.

On September 9 occurred the first of a series of elevations of temperature, which recurred at irregular intervals up to the time of his death. These were sometimes accompanied by rigors, sometimes not.

On September 17 my colleague, Mr. Raymond Johnson, who was taking charge of my wards at the time, explored the mastoid process, the upper surface of the temporal bone, and the lateral sulcus on the left side. No disease was met with.

No marked results followed this operation, though apparently the pain was less for a time: the rigors continued and the optic disks became more hyperæmic. The deafness became more marked, and the intellect rather dulled, though he was still very intelligent, and in the intervals of freedom from pain quite bright.

On September 30 a swelling was noticed behind the right mastoid process, which was evidently an abscess. It must be remembered that repeated observation had failed to detect any sign of disease upon this side.

On October 1 I opened the abscess and found that pus was escaping (with pulsations synchronous with the heart's beat) from the right mastoid vein. The lateral sulcus was freely opened; it contained pus. I thought the sinus was not plugged, but probably this was a mistake; the antrum contained a small quantity of pus.

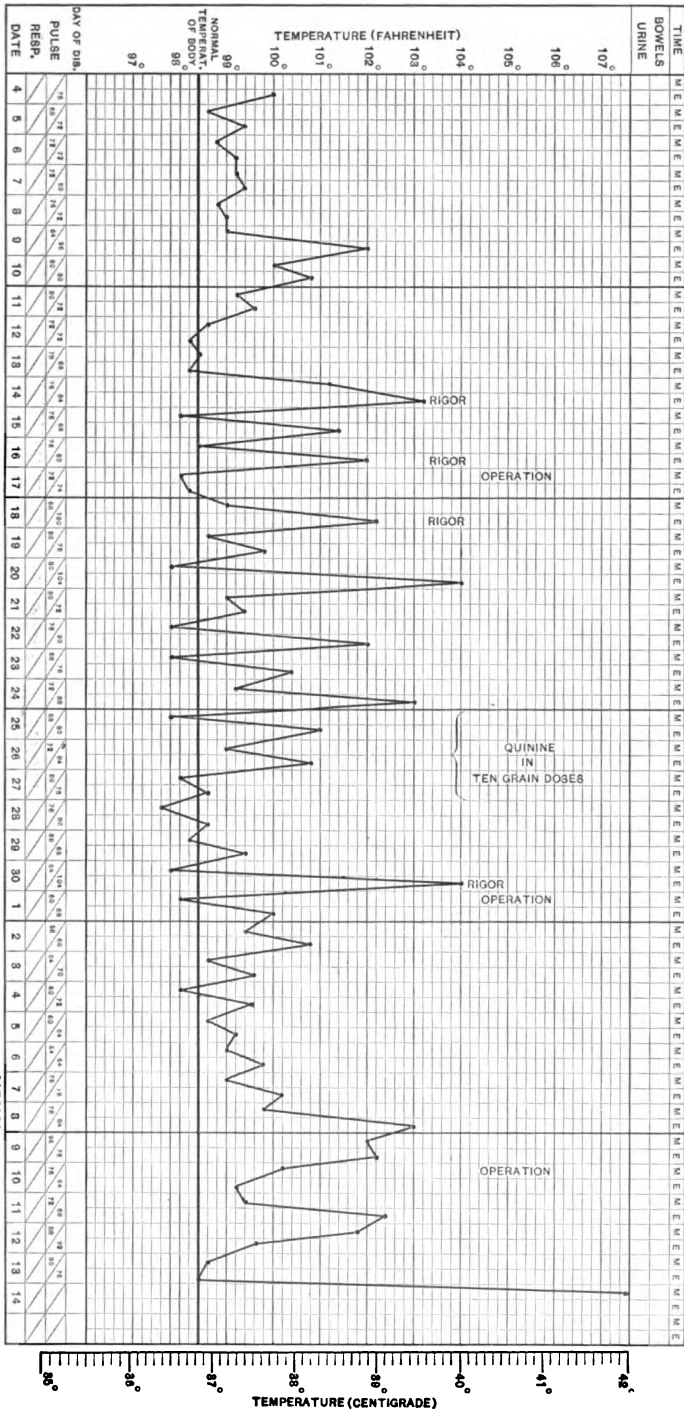
The temperature (see Chart II.) now remained down for a week; but the patient became more drowsy and the blurring of the disks became more marked.

On the 9th the temperature rose again, and the man was evidently going down hill. I therefore opened up the sulcus more freely, and, finding that the sinus was blocked, I tied the internal jugular vein in the neck and opened up the sinus still farther, and, after scraping it and washing it out with a boric acid lotion, inserted a small drainage-tube. I also explored the roof of the tympanum and the temporo-sphenoidal lobe and cerebellum without meeting with pus.

No benefit was derived from this operation. On October 13 I again explored the brain (without giving an anæsthetic), but without result.

On October 14 the patient became comatose and died, the temperature rising after death to 107.8° F.

CHART II.



Temperature record of an adult case of middle-ear disease.

Post mortem we found extensive purulent meningitis all over both cerebral hemispheres, the lymph being particularly thick around the fissures of Rolando; it extended also all over the base, and pus was found coming from the left—not the right—internal auditory meatus. There was an excess of fluid in the ventricles and it was somewhat turbid. There was no abscess in the brain.

The right lateral sinus, which had been opened for one and one-fourth inches, was plugged above the opening with a dark clot which was breaking down. This clot extended across the torcular Herophili as far as the commencement of the descending part of the left sinus, beyond which the vein was healthy. The lower part of the right lateral sinus was filled with a breaking-down clot as far as the jugular foramen, but the jugular vein above the point of ligature was occupied by a recent and healthy clot. The superior longitudinal sinus was not thrombosed, but the inferior longitudinal and straight sinuses were plugged by an adherent and partially discolored clot.

It is impossible to say how long the meningitis had been present: it did not look very recent. Had it not been for the pus coming from the left internal auditory meatus I should not have doubted that it had started from the thrombosed sinus. I think it must be assumed that the thrombosis was of pretty long standing; it probably started before the commencement of the rigors, and must have depended upon the latent disease of the middle ear on the right side.

My colleague, Professor Thane, has recently been making a number of sections of the temporal bone for the purpose of illustrating the chapter on superficial and topographical anatomy in the last edition of Quain's "Anatomy," in the writing of which I have the honor of collaborating with him. Some of these sections I now show you, as well as some drawings that I have made from them, and I have been trying to devise from them some sort of description which will give you a graphic idea of the size and shape of the cavity which may be the seat of suppuration in middle-ear disease. It is extremely complicated, even without considering the mastoid cells which pullulate out from three sides of the antrum. The tympanum itself is difficult enough to understand,—the days are past when we can be content with Mr. Ellis's classical description of it as being of the size and shape of a quarter of an inch cut off the end of the cork of a four-ounce phial. Now the least that can be said of it is that it¹ "is a narrow irregular cavity in the substance of the temporal bone, placed between the membrane oc-

¹ Quain's Anatomy, tenth edition, vol. iii., part iii., p. 80.

cluding the inner end of the external auditory canal and the outer bony wall of the labyrinth. Its width between the boundaries varies from about two millimetres to four millimetres ($\frac{1}{4}$ to $\frac{1}{2}$ of an inch), being narrowest opposite the middle of the membrane; and narrower below and in front than above and behind. It measures about fifteen millimetres ($\frac{3}{4}$ of an inch) from above down, and about the same from before back. The vertical measurement includes the so-called *recessus epitympanicus* or *auditus ad antrum*, which lodges the head of the malleus and the greater part of the incus: this by Bezold and other authors is excluded from the tympanum proper, which without it measures about nine millimetres (rather less than $\frac{1}{2}$ an inch). In other words, the entrance to the mastoid antrum and the mastoid cells is about nine millimetres (rather less than $\frac{1}{2}$ an inch) above the bottom of the tympanic cavity. The orifice of the Eustachian tube is about four millimetres ($\frac{1}{4}$ of an inch) above the lowest part of the floor."

This is, indeed, very little like a drum: the shape being modified (1) by its extreme narrowness; (2) by the prolongation into the Eustachian tube; (3) by the presence of the recessus epitympanicus or tympanic attic, as it has been called.

Mr. Thane compares the antrum to the bulb of a retort somewhat compressed in the transverse direction, the neck of which corresponds to the epitympanic recess, and I may add that the neck is bent with the convexity upward. Its size varies very much, but an average will be between ten and fifteen millimetres ($\frac{3}{8}$ and $\frac{1}{2}$ of an inch) longitudinally, about ten millimetres ($\frac{3}{8}$ inch) vertically, and from four to six millimetres ($\frac{1}{8}$ to $\frac{1}{4}$ inch) transversely, so it does not differ very much in size from that of the tympanum.

Imagine, then, this compressed retort-bulb joined to the very flat and irregular drum of the tympanum at the upper part by its bent neck, and you will gather an idea of the main part of the cavity; add to these the uncertain quantity of the mastoid cells, some few examples of which I now show you, and you will appreciate what an extensive space is liable to be affected by suppuration. (Figs. 1, 2, 7, 8, 9.)

The communication between the antrum and the tympanum is somewhat triangular in transverse section (Fig. 6), the apex being downward and rounded. It is usually on a level with or altogether above the external auditory meatus (Figs. 9 and 10); and as the bottom of the antrum is at a considerably lower level, extending about half-way down the external auditory meatus (Figs. 9 and 10), it will be seen how imperfectly pus is likely to drain out of it into the tympanum. At the lower part of the inner wall of this passage is a slight prominence,

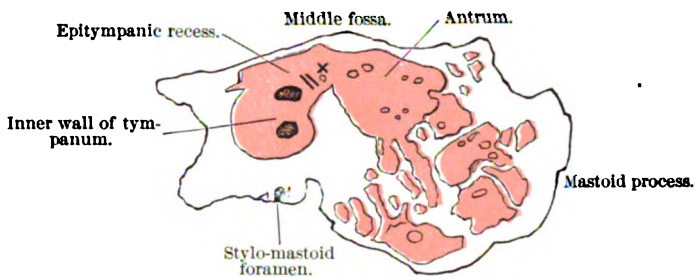


FIG. 1.—Sagittal section of left temporal bone.

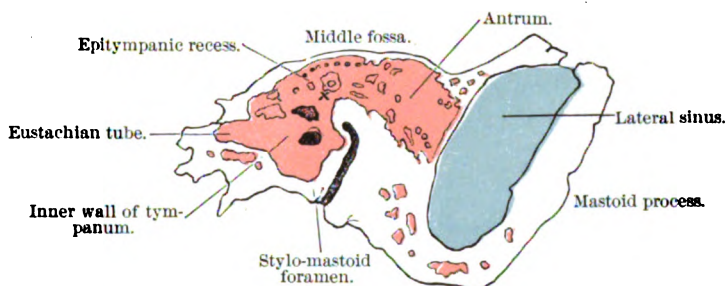


FIG. 2.—Sagittal section of left temporal bone made internally to that shown in Fig. 1.

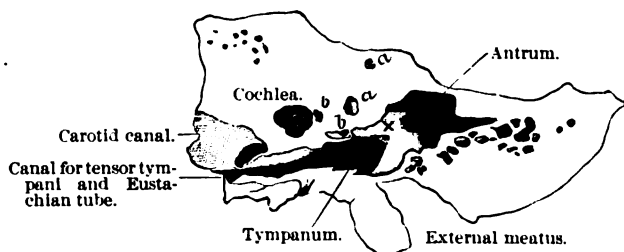


FIG. 3.—Oblique section of left temporal bone in direction of Eustachian tube. aa, superior semicircular canal; bb, aqueduct of Fallopius.

In each drawing X is placed over the prominence formed by the external semicircular canal and just above the elevation caused by the aqueductus Fallopii.

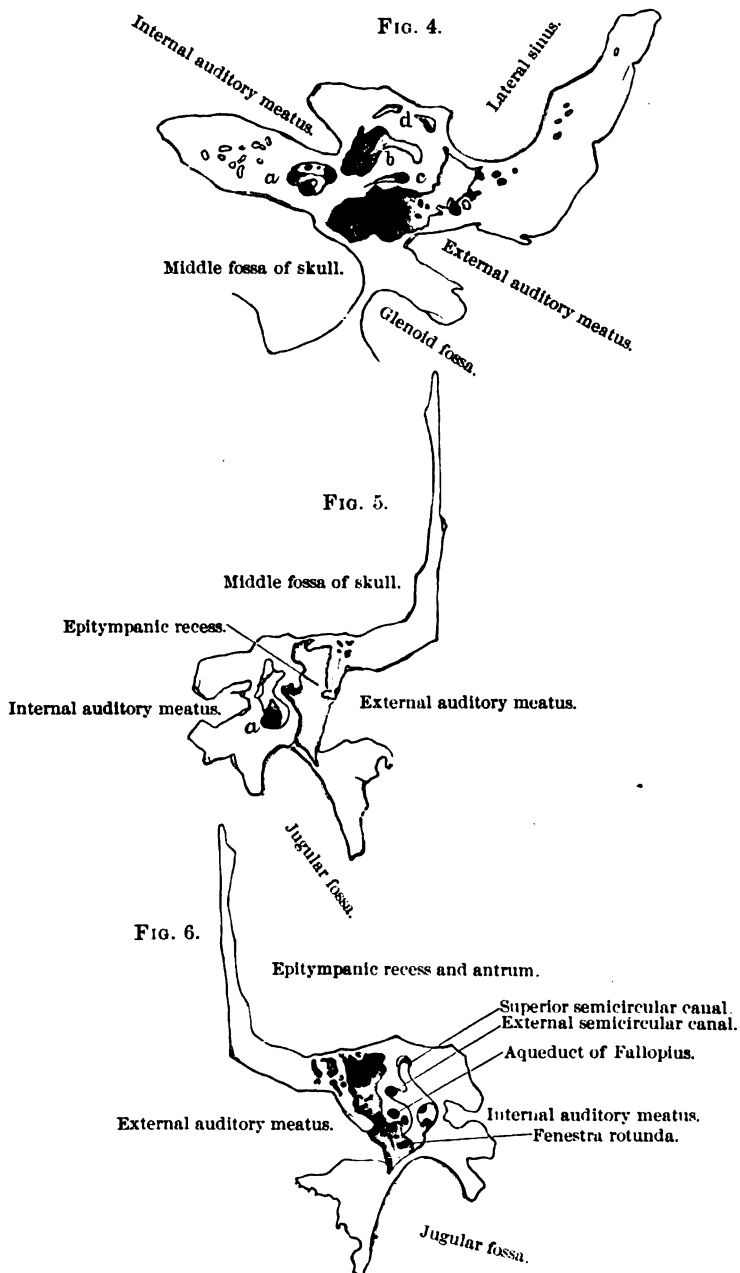


FIG. 4.—Horizontal section of left temporal bone. *a*, cochlea; *b*, vestibule; *c*, aqueduct of Fallopius.

FIG. 5.—Frontal section of right temporal bone looking forward. *a*, vestibule.

FIG. 6.—Frontal section of right temporal bone looking backward.

not always easy to see, formed by the external semicircular canal. (Figs. 1, 2, and 3.) Just below and in front of it is another slight elevation caused by the canal for the facial nerve. (Figs. 1 and 2.) I must warn you, in spite of book-descriptions, that you need not expect when operating on a mastoid antrum to see this minute elevation, however carefully you sponge away the blood. I do not say it cannot be done by very experienced operators, but you will have to operate with limited experience, and it behooves you therefore to know by examining specimens previously where it is, which is comparatively easy, and then there should be little or no risk of injuring the nerve. It is a most annoying mistake which, so to speak, always stares you in the face afterwards.

We must now consider the relation of the antrum to the surrounding parts. (1) To the middle fossa. The roof of the antrum is only separated from it by a thin plate of bone, which is continuous with the tegmen tympani (Figs. 1 and 2). The two together form a somewhat oval plate about one inch in length and varying in width from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch, the narrowest part corresponding to the attic. It is directed backward and outward near the junction of the petrous and squamous portions of the temporal bone (Fig. 11). Not unfrequently the bone is perforated by small holes.

Posteriorly the antrum is separated from the descending part of the lateral sinus (Figs. 2, 4, 5, and 6), sometimes only by a very thin plate of bone, but more often by a layer of mastoid cells from five to ten millimetres ($\frac{1}{4}$ to $\frac{1}{2}$ inch) in thickness. Sometimes also it is only separated by a thin osseous plate of bone from the posterior surface of the petrous portion, coming into close contact with a triangular part of this surface half an inch in the side, the apex of which is where the sulcus recedes from the superior border of the bone. Usually, however, the bone is thicker here. It is a situation where the arachnoid may become adherent to the dura mater, and mischief may thus extend directly to the cerebellum.

We have only to think of the vessels and lymphatics passing through these narrow spaces to understand how easily septic meningitis or thrombosis of the lateral sinus may follow middle-ear suppuration.

Lastly, we come to the outer surface of the skull. The antrum extends outward as well as backward (Fig. 4), so it is nearer the surface behind than in front. But the distance varies so much that no trustworthy help on the subject can be supplied by the anatomist. In front, where it will be probably opened, the depth varies usually from

seven to fourteen millimetres ($\frac{1}{8}$ inch to $\frac{3}{8}$ inch), but the extreme limits of variation are from three millimetres to eighteen millimetres ($\frac{1}{10}$ inch to $\frac{3}{4}$ inch) or even more. It is usually more deeply situated than the lateral sulcus. The middle fossa of the skull always projects beyond it, and sometimes descends below the level of its roof, as will be presently seen.

In Fig. 10 I have endeavored to project the antrum as well as the tympanum and the epitympanic recess onto the surface of the skull. You will see that the roof reaches almost or quite as high as the supramastoid crest (posterior root of the zygoma), sometimes, indeed, it reaches above that level, in which case it is almost sure to be overlapped by the inferior temporal convolution. The floor, as has been said, does not usually descend below the level of the centre of the external auditory meatus.

I trust I have extracted enough from the mass of possible description, to make the matter somewhat clear, though I fear that even this may prove confusing. It is intended to be enough to explain the directions usually given for opening the antrum.

Macewen describes a triangle bounded by the upper half of the posterior wall of the external meatus, the supramastoid crest, and an imaginary base line dropped from the latter at the level of the posterior wall of the external meatus. Each side of this triangle is not more than about $\frac{3}{8}$ of an inch long. By making a small opening in this space and following the direction of the external meatus, into which a probe is inserted as a guide, the anterior and lower part of the antrum should be reached, but if you want to be sure of avoiding the middle fossa, you must keep below the level of the top of the meatus, which rather cramps your proceedings.

I have recently been adopting what seems to me the very good plan of taking away the posterior wall of the meatus, and thus laying the whole of the complicated cavity freely open.

My colleague, Mr. Pollard, I believe, recommends taking off, to begin with, a thin layer of the outer surface of the mastoid, which has the advantage of disclosing the state of the air-cells, and the only objection to which can be the occasional very close proximity of the sinus to the surface.

It must not be forgotten that the anatomical conditions are usually much altered by pathological processes, and also that, in the child (Fig. 7), the mastoid cells are very little developed, though the antrum is present. Often, therefore, the tissue that is cut through is dense, sclerosed bone, especially if the disease be of long standing. A slight

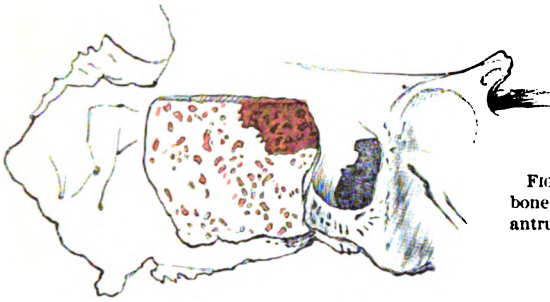


FIG. 7.—Part of the right temporal bone of a child, showing mastoid, antrum, and small mastoid cells.

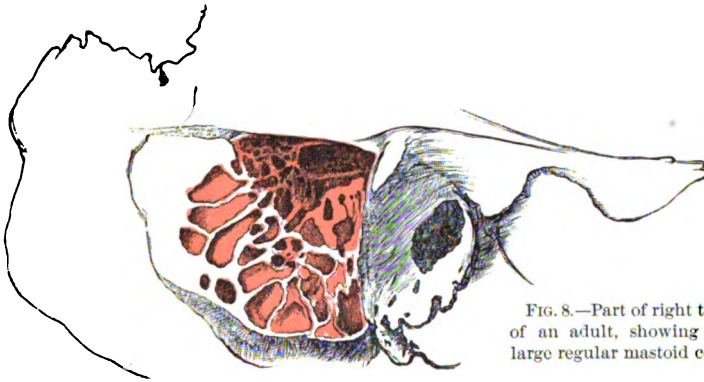


FIG. 8.—Part of right temporal bone of an adult, showing antrum and large regular mastoid cells.

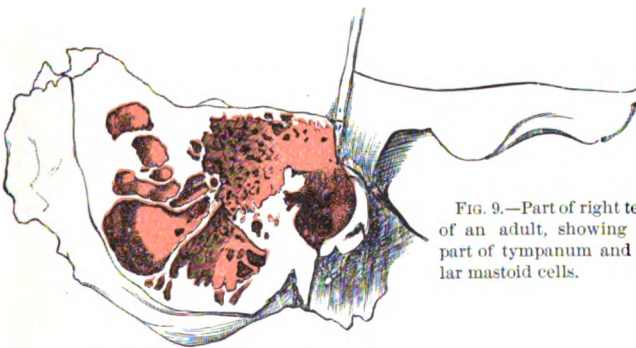


FIG. 9.—Part of right temporal bone of an adult, showing antrum and part of tympanum and large irregular mastoid cells.



FIG. 10.—Left temporal bone, outer aspect, showing relations of tympanum, antrum, and lateral sinus to the surface.

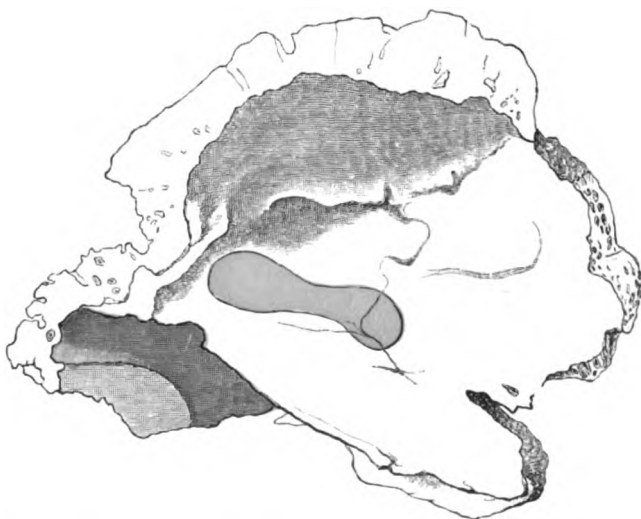


FIG. 11.—Inner and upper aspect of left temporal, showing relations of tympanum and antrum to middle fossa and of lateral sinus to posterior fossa.

extension backward of the cut in the bone brings the sinus into view, and by going a little farther upward the middle fossa and the roof of the tympanum can be explored, and then, of course, the temporo-sphenoidal lobe can be punctured. To investigate the cerebllum, however, an opening behind the lateral sulcus must be made.

Very different opinions have been expressed as to the sort of instrument which should be used. No doubt, if a surgical engine is at hand, worked by electricity, or some other agency, and provided with suitable burrs, this is the most exact and least dangerous apparatus. But you will have to operate without these refinements, and you have seen enough in this hospital to show that these delicate manipulations can be safely carried out with gouges and chisels and a mallet. The mallet may, indeed, be dispensed with, but you are less likely to do harm by letting the instrument slip if you cut by means of very gentle taps with the mallet than if you trust to your power of restraining exactly your own muscular efforts, especially if the bone be hard.

In conclusion, let me remind you that if, in the later stages, you resort to the use of the sharp spoon, there is not only the facial nerve to be avoided in the position I have indicated, but the carotid artery lies in close proximity to the inner wall of the tympanum, at the anterior part, and the jugular fossa corresponds to the floor of the cavity.

ADENOID GROWTHS OF THE NASO-PHARYNX; CHRONIC FOLLICULAR TONSILLITIS.

CLINICAL LECTURE DELIVERED AT THE HOSPITAL COLLEGE OF MEDICINE.

BY SAMUEL G. DABNEY, M.D.,

**Professor of Physiology and Clinical Lecturer on Diseases of the Eye, Ear, Nose,
and Throat in the Hospital College of Medicine, etc., Louisville, Kentucky.**

GENTLEMEN,—This little patient, E. J., aged five years, is brought to us by the mother for treatment. The first peculiarity to which I would direct your attention is the facial expression; you will observe that the bridge of the nose is broad and the mouth is open. There is some nasal discharge. He is a mouth-breather, and this in itself is a symptom of obstruction, which may be in the nose, or, as is most frequently the case in the child, in the space between the nose and the throat,—sometimes it is in the throat itself. Enlarged faucial tonsils alone may cause mouth-breathing in some cases, but this is an exception as far as my observation goes. As a rule, such tonsils are accompanied by adenoid growths, and this latter condition is the chief obstacle to proper respiration. When we see a child who is a mouth-breather, and with a decided thickening at the bridge of the nose, as is present in this case, and with a nasal discharge, the chances are very strongly in favor of his having adenoid growths in the post-nasal space; this condition is also known as enlarged third tonsil, or the tonsil of Luscha. By these different names we mean an accumulation of adenoid tissue in the roof of the mouth where the nose and the throat come together. There are some other symptoms in these cases. Middle-ear disease is not infrequently met with, although this case seems to have been free from ear trouble. You will readily understand how and why it is that adenoid growths so often produce disease of the middle ear. Their point of attachment is at the roof of the pharynx and high up on the lateral walls of the pharynx. Hanging down from this situation they prevent the proper passage of air into the Eustachian tube and through it into the middle ear. So that when we examine the drum membrane from without we generally find in

these cases of adenoid growths that it is sunken in. That is the condition in which we would reasonably expect to find it, because the balance of the air is not maintained, the adenoid growths in the vault preventing the air going through the Eustachian tube into the middle ear, and then the atmospheric pressure from the outside pushing in the drum membrane. Frequently we observe chronic or, it may be, acute suppurative otitis media in these cases, even more frequently chronic non-suppurative disease of the middle ear. In many cases there is a troublesome cough, but this is also absent in the case before us. Some of you will doubtless remember a child upon whom I operated several weeks ago for a very marked case of adenoid growths in the naso-pharynx. In that case cough was a pronounced symptom, it was particularly troublesome at night, keeping the patient and his parents awake the greater part of the night. The cough has entirely disappeared since the removal of the adenoid growths. In a large majority of these cases there is a thickening and nasal twang of the voice, but we cannot observe this symptom in the child before us, as it is very difficult to get children of this age to talk before so large an assemblage. Sometimes there is a stomach disturbance which is due to mucus accumulating in the naso-pharynx acting reflexly upon the stomach, or it may drop into the throat and be swallowed into the stomach,—the latter is a very common condition.

Now, I am going to show you how to make a positive diagnosis in these cases. Before making an examination, which is best done with the forefinger, I place a metal finger protector over the examining digit. This consists of a contrivance similar to a coat of mail, which just fits the finger and has flexible joints. In making this examination the child is held upright in the attendant's lap, a towel is pinned around the arms; the mother or attendant is to hold the child with the head resting against her breast or shoulder, with the child's legs held between her knees. Now, my assistant will stand back of the child, and will steady the head. In making an examination for adenoid growths, which is a little painful, it is always well to look at the nose first of all, and at the pharynx itself, to see if there are any enlarged tonsils. You observe the position of the child, held in the lap of the attendant, the child's head resting against the mother's shoulder, the head steadied by an assistant who stands behind. I will first introduce a speculum and examine the anterior nares. I find that the child has a thickened septum, which probably in a large measure accounts for the mouth-breathing rather than the presence of adenoid growths. However, there is a small growth of adenoid tissue in the naso-pharynx,

and that I shall remove. Now, putting my finger into the child's mouth, I carry it around the soft palate, thence to the posterior nares, then feel the posterior edge of the septum, the naso-pharyngeal space, and post-nasal openings. If adenoid growths are present I will detect a soft feeling, generally compared to a bunch of worms, at the roof of the mouth. If no adenoid growths or other new formations are present, the walls of the naso-pharynx will feel firm and hard like bone just covered with a thin mucous membrane, which is the way it should feel in the normal condition. If instead of five this patient was twenty-five years of age, we would make the examination in a different way; we would reflect the light into the throat, and, with the uvula pendent or drawn forward, carry a small mirror back of it and get a view of the naso-pharynx. Posterior rhinoscopy this is called. This is not easily practicable in young children, so we trust to the sense of touch, and for that, of course, we must have an educated finger. In this case the adenoid development is so little that there will not be much to remove. The child's trouble comes chiefly from a thickened septum anteriorly, a condition that we will remove at some future time. Here are the only three instruments that I use in the removal of adenoid growths. In the first place, I will draw the palate forward with a *palate retractor*, next a pair of *forceps*, designed for the purpose, are carried around the palate to the roof of the mouth, and made to grasp as much as possible of the growth. I have often removed a piece as large as a chestnut at a single bite with one of these instruments. The growths vary greatly as to size,—some are as large as a good-sized chestnut, others no larger than a pea. After these adenoids have been removed, I usually carry a curette up into the roof of the mouth and curette the naso-pharynx, both the roof and the posterior wall. In some instances a part of the tissue removed is swallowed with the blood, so that we see only a small part of what is actually removed. It sometimes becomes necessary to use the mouth-gag, but I prefer not to do so, and in the case before us I hardly think it will be necessary. I pass the instrument back into the naso-pharynx, and you see the amount of adenoid tissue removed is very small. I doubt not a portion of the mass was swallowed after being loosened, and I show you the small piece removed. We will do nothing further for this child at present, and if the hard breathing continues we will at some future time remove a piece of the thickened septum.

To sum up the conditions represented in adenoid growths about the naso-pharynx, we would say that these patients are mouth-breathers as a rule; that they often have a cough; that most of them have some

impairment of voice ; that we have diseases of the ear either suppurative or non-suppurative in a large proportion of the cases, which is generally relieved or greatly improved by the removal of adenoids ; that the general health is impaired by obstructed nasal respiration.

CASE II.—This little girl, K. S., aged thirteen years, you will remember having seen before. She looks rather thin and anæmic, though her color is somewhat better than when she first presented here for treatment. Some of you will remember that she has enlarged glands on each side of the neck, and she has arrived at about the age when we may expect menstruation to be established. She is a fair representative of what is known as the strumous type, with enlarged lymphatic glands ; she has a pale, anæmic look, and a rather delicate constitution generally. She was originally brought here for treatment because of pain in her throat, mostly referred to the left side. We prescribed tonics, consisting of syrup of the iodide of iron and cod-liver oil. She was advised to abstain from sweets of all kinds,—cakes, candies, pastries, etc.,—and ordered a plain, wholesome diet at regular times. The mother reports that for quite a long time the patient has been in bad health. We will now proceed to make an examination of her throat. Those of you who can see over my shoulder will observe that this child's throat is hyperæmic ; there is diffused redness on each side ; the right tonsil is slightly enlarged, and projects beyond the pillars. You will observe that there is a little cheesy mass located in a very deep opening in the tonsil. Removing this mass with the probe I find it has a bad odor. This, therefore, is a case of deep-seated chronic follicular tonsillitis. The best thing to do with these somewhat enlarged and diseased tonsils is to cut off the projecting piece, and as much as possible of the deeper portion. Whenever the tonsil projects much beyond the pillars of the fauces, this is very easily accomplished. In fact, I regard it as one of the simplest of all operations upon the throat, and it can be very quickly done. But when the disease is deep-seated, and the tonsil does not project much beyond the pillar, it is sometimes difficult to catch it in the tonsillitome. The instrument that I prefer for the purpose is the Mathieu tonsillitome, which I show you. I will now introduce this instrument into the throat and clip off the slightly enlarged tonsil. You will see here the slice removed. Sometimes instead of being a small mass like this it is a piece as large as the first joint of my thumb.

A few words about the indications for removing enlarged tonsils and the dangers incident to it. A great many more enlarged tonsils are cut out to-day than ten years ago, because we more fully appreciate

the importance of it. It would be safe to say, in all children under eight years of age, when the tonsils project much beyond the pillars of the fauces into the throat, it is advisable to remove the projecting portion. One of the advantages in so doing is that the child is made less liable to have infectious diseases, such as scarlet fever and diphtheria: the enlarged tonsil acts as a sponge to catch the poison of these diseases. Second, if they should have either of these diseases, the attack is likely to be much more severe in patients with enlarged tonsils than in those whose tonsils are normal. Another indication for their removal is frequent sore throat. Many cases are relieved of a frequently-recurring sore throat by the removal of enlarged tonsils. Cases like the one before us, of chronic follicular tonsillitis, are sometimes wonderfully improved by simply slicing off that portion of the inflamed tissue. The third indication for the removal of enlarged tonsils is ear trouble, which is present in a great many cases. Every child who has enlarged tonsils, and who is the subject of either suppurative or non-suppurative inflammation of the middle ear, ought to have them removed; they will act as a source of irritation; the very fact of having enlarged tonsils in the throat keeps up an irritation of the pharynx or nasopharynx which is injurious to the ear. The fourth indication for removing enlarged tonsils is mouth-breathing. In a large proportion of cases of enlarged faucial tonsils there is at the same time an enlargement of the third tonsil, the so-called adenoid growths in the roof of the mouth, and we should always remove them also; they are somewhat similar in structure and similar in effect. To relieve the mouth-breathing, therefore, it behooves us to remove the enlarged tonsils, remembering that mouth-breathing, however, is more frequently due to an accumulation of adenoid growths.

The question might be asked, What is the harm of mouth-breathing? I am going to tell you some of its evils. When air goes through the nose it is changed in three respects; first, it is made warmer; second, it is made more moist; and, third, it is partially filtered of its impurities. By this means, then, the air is prepared for its reception into the lower air-passages. Air passing over the larynx and bronchial tubes that has not been thus prepared is liable to excite disease of these structures. So that we very frequently find laryngitis, trachitis, bronchitis, etc., produced, in a large measure at least, by mouth-breathing. The effects of improper respiration are speedily shown upon the general health; children who are mouth-breathers are usually anæmic, often weak, there is a diminution of red blood-corpuscles because of faulty oxygenation, the patients becoming pallid in consequence; and if we

do nothing more for them than to open their upper air-passages, so as to allow free respiration through the nose, they will often be wonderfully improved. I have recently had two cases, sisters, in private practice, where great improvement in the general health followed the removal of enlarged faucial tonsils. Their parents had taken them to the sea-shore, they had been given tonics, etc., without beneficial effect. In each case there were several enlarged glands in the neck and considerable enlargement of the faucial tonsils, they also suffered with occasional attacks of sore throat. The simple removal of enlarged tonsils in these two cases brought about a radical change in the general health of the patients: their color became good, and they became vigorous, healthy children. They have learned to breathe as they ought.

How shall we remove enlarged tonsils, and what are the dangers incident to it? Hemorrhage is the great bugbear that arises in the mind of the general practitioner; he remembers there are some large blood-vessels somewhere in that neighborhood, and thinks maybe they might be cut. First of all, we should select proper instruments. You cannot possibly cut a great vessel by using the Mathieu tonsillitome or the Mackenzie tonsillitome, either of which will answer well for the purpose. I advise your never attempting to remove enlarged tonsils by means of the bistoury. This may be done by expert operators, but in other hands is attended with danger. I advise you, if you are going to remove tonsils, to provide yourself with a tonsillitome with which to perform the operation. If the patient to be operated upon be a child under say twelve or fourteen years of age, you can count the danger of hemorrhage out, barring, of course, the hemorrhagic diathesis. In older persons, however, there is a certain amount of danger to be anticipated from hemorrhage. As people become older the tonsil becomes harder, there is more fibrous tissue in it, so that when we cut this hard tissue shrinkage is not so prompt as obtains in the soft tonsils of childhood. The severed blood-vessels in these hard, fibrous tonsils are not readily closed,—they remain patulous for a longer period,—which is the reason we are apt to have more serious hemorrhage in cutting out the tonsils of grown people. Notwithstanding the fact that in children the tonsil is still soft, and hence there is little danger from hemorrhage, and that even in grown persons the danger of hemorrhage is not very great, yet I would advise that you always have at hand the following mixture:

Tannic acid, ℥vi;
Gallic acid, ℥ii;
Aque destillatæ, ℥i.

A formula suggested by Mackenzie. This should be well shaken, and the patient allowed to sip it freely and gargle the throat well directly after the operation; if they happen to swallow a small quantity it can do no harm. It is an excellent hæmostatic not only for this purpose, but for others.

Another thing that I advise you to have ready is a saucer of powdered ice. As soon as the tonsil is removed have the patient hold a little of this in the mouth. It relieves the after-pain and lessens the danger of hemorrhage.

Cocaine will not do much, if anything, to lessen the pain in removing tonsils. Though the pain is not intense, yet it is, of course, considerable. The only way in which cocaine could have much effect would be to inject it into the surface of the tonsil, and that would be a risky procedure. Its absorption into the general circulation would be rapid, and it would be beyond our power to control it. So that not much good can be anticipated from the use of cocaine in this operation. If you use it at all, apply with a small mop consisting of some absorbent cotton matted on a probe; immerse this mop in a four- to ten-per-cent. solution of cocaine, squeeze it thoroughly so that none will drip, then apply it over the surface of the tonsil, adjust the tonsillitome, and clip quickly.

It is sometimes difficult to engage a small tonsil in the tonsillitome, while if the tonsil is large it becomes an easy matter. Press down the tongue with the instrument as you insert it. The patient will probably gag, but this is an advantage, as it throws the tonsil forward; and as the patient gags you will catch the projecting part of the tonsil, press the instrument firmly on the side of the throat, and then cut.

After-treatment is usually not required, but one point you must remember. You should not allow children whose tonsils have been cut to go to school or mingle promiscuously with other children until the raw surface has healed. In a large collection of children we are very liable to find some with infectious diseases like diphtheria or scarlet fever, and a child whose tonsils have recently been cut is certainly in condition to readily take such diseases. The ground is prepared, the surface is open ready to receive the germs of an infectious disease. So I would advise that children who have been operated upon in this manner be kept away from school until the tonsil has healed. Bear in mind that most of these cases of enlarged tonsils will require general treatment. I have no doubt the formerly prevailing impression that the removal of enlarged tonsils was unnecessary was due to the fact that such a marked improvement followed general treatment. The patients

should be instructed to take a plain, wholesome diet at regular times, taking nothing between meals, and avoiding candy, pastry, and sweets of all kinds. These things will accomplish a great deal towards lessening the tendency to sore throat. But, after all, when there is chronic enlargement of the tonsils, with or without inflammation, you will accomplish the most by removing them. As to medicinal treatment, we will give the muriated tincture or syrup of the iodide of iron, twelve to fifteen drops, and cod-liver oil.

NASO-PHARYNGEAL ADENOID VEGETATIONS AND THEIR RELATION TO MORBID AFFECTIONS OF THE EAR.

POST-GRADUATE LECTURE DELIVERED AT OWEN'S COLLEGE, MANCHESTER.

BY W. MILLIGAN, M.D.,

Hon. Surgeon, Manchester Ear Institution ; Lecturer upon Diseases of the Ear, the
Owen's College ; Hon. Assistant Physician to the Manchester Throat Hospital.

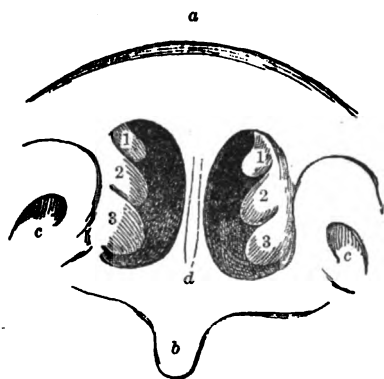
GENTLEMEN,—By this time you will no doubt have been much impressed by the frequency with which various forms of middle-ear disease have been found to depend upon morbid conditions of the naso-pharyngeal mucosa. As I have stated before, one of the main factors in producing both suppurative and non-suppurative inflammatory conditions of the tympanic and Eustachian mucous membrane is the presence of naso-pharyngeal adenoids. Let us consider now what these vegetations really are and in what way they exert an injurious influence upon the ear or ears. In the normal condition of affairs the naso-pharyngeal mucosa contains a certain amount of adenoid or lymphoid tissue. As the result of various exciting causes this adenoid tissue may increase largely in bulk and give rise to certain morbid phenomena. As a rule this increase in bulk will be found in a line running across the vault of the naso-pharynx from one Eustachian tube to the other. At other times, however, the fossæ of Rosenmüller will alone appear to be involved, while in yet other cases isolated masses of tissue will be found studding the naso-pharyngeal vault, and even the posterior pharyngeal wall. Small hypertrophied masses may be present and give rise to no special symptoms, but when the amount has attained any proportions various effects are produced. As one would naturally expect, cases of adenoid hypertrophy are far more frequently met with among children and adolescents than among those who have passed into manhood or womanhood. Nor is it difficult to understand this when we recollect that lymphoid tissue is a tissue which is prone to undergo atrophy and absorption with advancing years. The symptoms which

accompany the presence of adenoid vegetations are numerous and important. Perhaps one of the commonest and most striking symptoms is the pinched and expressionless cast of the features. A child the subject of well-marked adenoids presents a pale, pinched, and almost emotionless face. The mouth is usually kept partially open, while respiration, which is largely conducted through this channel, is noisy and labored. The nasal dilators will be found partially atrophied and inactive even when forced attempts at respiration are made. An examination of the buccal cavities in a large proportion of cases reveals an irregular eruption of the teeth and a highly-arched palate. The buccal and pharyngeal mucous membrane may be dry and glazed in appearance while hypertrophied tonsils frequently coexist. In other cases, and these are certainly the more frequent, a thick tenacious secretion may be seen slowly trickling from the naso-pharyngeal cavity along the posterior pharyngeal wall into the œsophagus and so on into the stomach. How now are we to ascertain accurately the presence of these vegetations, the existence of which, from the few symptoms I have mentioned above, we are led to suspect? The methods of direct examination may be said to be two in number,—(1) examination with the rhinoscopic mirror; (2) palpation of the naso-pharynx with the finger. When possible, examination with the rhinoscopic mirror is, I believe, the most satisfactory and is certainly the most pleasant for the patient. The main drawback is that it is a method which is inapplicable in very young children, and also in those cases where the space between the margin of the soft palate and the posterior pharyngeal wall is very small. Irritability of the mucosa can in practically all cases be overcome by means of a cocaine spray, hence we need hardly state its existence as any valid objection to a satisfactory rhinoscopic examination. In order to perform posterior rhinoscopy satisfactorily the patient should be seated directly in front of the surgeon, while the rays from a good source of light are thrown into the open mouth by means of a forehead mirror. In practically every case it is essential to depress the tongue. This is, I believe, most effectually accomplished by means of a straight spatula held in the surgeon's left hand, firm pressure being made downward and forward upon its dorsum. The rhinoscopic mirror, previously warmed, is now introduced gently into the mouth and guided behind the uvula and soft palate, care being taken not to touch the surrounding pharyngeal mucosa. By tilting the mirror downward—in other words, by elevating its handle—a view of the vault of the septum nasi and of the upper portions of both choanæ is obtained, whilst by a slight lateral inclination, first to one side and

then to the other, the Eustachian tubes and the fossæ of Rosenmüller may be seen. The accompanying diagram shows the parts in a normal naso-pharynx. (See Fig 1.)

As above stated, the main mass of hypertrophied adenoid tissue is usually found in a line crossing the vault from the one Eustachian tube to the other. This mass may present as a coarse band or may appear to possess a bunched and wavy outline, something like a bunch of grapes, as has been described by some authors. The former appearance is in my opinion, however, much the more frequent, and its presence has the effect of preventing a view of the upper part of the septum nasi and of the two choanæ. The degree of hypertrophy may

FIG. 1.



Diagrammatic view of the normal naso-pharynx. — *a*, naso-pharyngeal vault; *b*, uvula; *c*, *c*, orifices of Eustachian tubes; *d*, septum nasi; 1, 2, 3, superior, middle, and inferior turbinates.

FIG. 2.

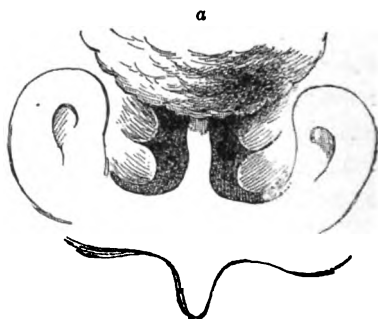


Diagram showing mass of adenoid tissue in the naso-pharynx (*a*).

of course vary greatly, and hence also the extent of our view of the naso-pharynx. (Fig. 2.)

In cases, however, where a successful rhinoscopic examination is impossible the surgeon must have recourse to the second method, that of digital exploration. This is a disagreeable and frequently painful proceeding, and it will be found a good plan to swab the back of the throat with a four-per-cent solution of cocaine before carrying it into effect. The surgeon must be careful that his right index-finger is perfectly clean and moistened with some antiseptic lotion before he introduces it into the naso-pharyngeal cavity. Personally I disapprove of the method of soaking the finger in absolute alcohol for a few minutes before examining, as I am convinced that the capabilities of tactile sensation are thereby materially lessened. To perform the examination

the surgeon should stand behind the patient and should depress the lower jaw with his left thumb and forefinger, which he has already protected by means of a towel. The right index-finger is now introduced into the open mouth and passed rapidly backward behind the soft palate. The vegetations, if present, are at once felt, and their position and extent can be rapidly gauged by a slight movement of the finger. The sensation imparted to the finger by their presence has been aptly described as resembling that produced from touching a bag of worms. The finger when withdrawn is found covered with blood, and if the posterior wall of the pharynx be now examined blood will be seen to be trickling down. The vegetations are in almost all cases so soft, friable, and vascular as to bleed freely, however gently touched.

The history given by a patient is frequently almost sufficient to warrant a diagnosis of the presence of vegetations, even without making any direct examination. The open mouth, the pinched features, the arched palate, the irregular dentition, the snoring and restlessness at night, and the lethargic or aprosexial temperament are of themselves almost pathognomonic of their presence. Having now considered a few of the main general symptoms produced by the presence of adenoids, let us pass to the changes which may ensue in the ear or ears.

In most cases both ears are affected, although perhaps not equally. A glance at the diagram of the normal naso-pharynx will show the position of the orifices of the Eustachian tubes, situated, as they are, one-half inch below the naso-pharyngeal vault, one-half inch above the level of the soft palate, one-half inch behind the posterior extremity of the inferior turbinated body, and one-half inch in front of the posterior pharyngeal wall. The mucosa which lines the pharyngeal vault is continuous along the course of the Eustachian tube with that lining the middle ear; hence any catarrhal condition originating in the one is liable simply from continuity of tissue to be propagated to the other. The resulting swelling of the mucosa soon obliterates the narrow lumen of the Eustachian tube, while the serous exudation which results still more effectually seals it up. If once chronic Eustachian obstruction be set up in this way the normal ventilation of the tympanic cavity which takes place with every act of swallowing is interfered with and secondary changes within the middle ear are prone to ensue. Gradually the air in the middle ear is absorbed by the action of the smaller blood-vessels. A partial vacuum is thus created within the middle ear, with the result that the pressure upon the external surface of the membrana tympani (which is that of the ordinary atmospheric pressure) causes the drum-

head to be thrown inward, or, as it is more usually described, "indrawn." As the membrane becomes indrawn or retracted it carries with it the ossicular chain. The objective effect of this is that we see the malleus handle tilted upward and backward,—in other words, foreshortened. The more the degree of retraction the greater the foreshortening of the malleus handle and the greater the prominence of the anterior and posterior folds which act in a way as hinges upon which the drum-head rotates. (Fig. 3.) The subjective effects of these

FIG. 3.



Retraction of the right membrana tympani, showing foreshortening of the malleus handle, prominence of the processus brevis, and marked prominence of the anterior and posterior folds of the membrane.

altered conditions are varying degrees of deafness, tinnitus, and vertigo. As the air within the middle ear is gradually absorbed, exudation of fluid from the dilated and ill-supported capillaries is frequent. Hence we get intermittent attacks of earache and exacerbations of existing deafness. As you are aware, also, if fluid be pent up for any length of time in a closed cavity suppuration is prone to supervene. So in the middle ear. As the result of the action of pathogenic organisms, streptococci, staphylococci, pneumococci, etc., suppuration is induced, accompanied by severe earache, rushing tinnitus, occasional vertigo, and increase of deafness. As the purulent

fluid increases in amount within the cavity of the middle ear the membrane begins to bulge, especially in its posterior segment, until, finally, a stage is reached when it can withstand the strain no longer, it gives way, and a perforation is thereby produced. The possible consequences of suppuration within the middle ear, the formation of granulation-polypi, caries, mastoid or intracranial suppuration, etc., are conditions which must be discussed in another lecture. Let us see now how such masses of adenoid vegetations should be treated in order to ward off, as it were, these serious secondary aural lesions. And first let me say that I am no advocate for treating these vegetations by means of sprays, lotions, pigments, and the like. Much valuable time is thus lost by what we may fairly call "tinkering." The question at issue is how are we to radically remove such growths? The choice of instruments for this purpose is very large, and each class of instruments has its own supporters. The ordinary finger-nail, the artificial nail (steel), post-nasal forceps, cold wire snare, the straight curette, the post-nasal curette, cutting antero-posteriorly or laterally, are the main instruments used for the purpose. I do not propose to weary you by reciting the various pros and cons for each instrument, but I shall describe that instrument and that method of operation which the

experience of many hundreds of cases has convinced me is the best. The instrument I am in the habit of using is Gottstein's curette. The patient is prepared for an anæsthetic in the ordinary way, and I may here say in passing that I believe in chloroform narcosis, and avoid such transient anæsthetics as nitrous oxide, bromide of ethyl, etc. The patient should be placed upon a table with the head hanging slightly over its edge. A dry towel should be wrapped around the patient's neck and a wet towel pinned around the head. The mouth should be kept open by means of a suitably-adjusted gag, and a beam of light thrown into it by means of a forehead mirror worn by the surgeon. The tongue is now to be depressed by the surgeon's left forefinger, and the curette, firmly grasped by the right hand, introduced into the naso-pharynx until it touches the septum nasi. With one bold stroke the adenoid tissue is swept out, the instrument describing in its progress a segment of a circle. Any small portions, which upon digital examination may be found still remaining, may be scraped out either by a second introduction of the curette or by means of the finger-nail. My advice to you is to clear out all the adenoid tissue and to leave none behind. Hemorrhage is, as a rule, free, but, owing to the dependent position of the head, trickles mainly from the front of the nose, the point of lowest level, and may be kept mopped out from the pharynx by means of sponges upon suitable holders. The after-treatment of such cases should be as simple as possible. For the first few days light and nutritious food—mainly cold—should be given, while ice to suck or an ice cream will often be found grateful. As regards any local treatment, I am in the habit of simply requesting the patient to make free use of the handkerchief and fight shy of all anti-septic sprays or lotions. The nasal mucus does all that is required in the way of cleansing. After healing has taken place suitable treatment for the ear should be prescribed.

Dermatology.

HÆMATHIDROSIS (BLOODY SWEAT).

BY ARTHUR VAN HARLINGEN, M.D.,

Emeritus Professor of Diseases of the Skin in the Philadelphia Polyclinic.

GENTLEMEN,—The affection we are about to consider is one of those diseases which we find vaguely described or barely mentioned in the text-books, and accounts of which are only sparsely scattered throughout medical literature. Nevertheless, the symptoms which it presents are of such a striking and, indeed, in some cases, of such a terrifying nature as to impress themselves deeply on the mind of the medical observer, and among the uneducated to assume an almost miraculous character. Indeed, in some cases reported the theological controversies which have arisen have overshadowed the medical aspect of the subject.

Two forms of cutaneous hemorrhage, accompanied by the escape of blood upon the surface, have been described. In one, a true hemorrhage takes place from the sudoriparous or coil-glands. Blood, pure or mingled with sweat, appears upon the surface in drops or issues from the glandular openings in tiny jets. No change can be observed at any outer point in the skin, neither in the epidermis nor in the capillary vessels. Blood may also ooze from the openings of the pilo-sebaceous glands, in which case it extends by capillary attraction along the shafts of the hairs. Blood may also flow from the Meibomian glands of the eyelids, and from the ceruminous glands of the ear.

The other form of cutaneous hemorrhage is sometimes called "dermatorrhagia." Here the blood does not proceed from the glandular apparatus of the skin, but from the sub-epidermic vascular network of the rete. The epidermis is eroded, raised up or detached, and the blood oozes out from the raw surface or pours out in small streams.

Both of these forms of hemorrhage may occur in the same patient and at the same time. In describing the affection under consideration, I shall speak of both forms indifferently as hæmathidrosis or bloody sweat.

Let me now, before describing the disease more systematically, quote a few illustrative cases which will serve to bring out the salient features which characterize its appearance.

Hebra, in his classic work on diseases of the skin, describes the case of a man coming under his personal observation, who, although strong and well-nourished, was attacked repeatedly with hemorrhage from the surface of the lower limbs. This generally occurred during the night, so that he first became aware that the bleeding had taken place by finding the sheet stained with blood when he awoke. On one occasion Hebra himself saw the blood flow from the uninjured back of the hand of this patient while sitting near him at table. The blood formed a jet which would about correspond in size to the duct of a sweat-gland. This jet had also a somewhat spiral form, and rose about one-twelfth of an inch above the surface of the skin.

Gendrin reports the case of a woman injured by a blow on the epigastrium, followed by occasional hæmatemesis and irregular menstruation. At the end of twelve years these symptoms disappeared, but hæmathidrosis supervened. Attacks of bloody sweat on one part of the body or another occurred almost daily. The front of the chest, the back, thighs, legs, feet, and the extremities of the fingers were at one time or another involved. When the hemorrhages ceased the patient lost her appetite, became oppressed, suffered with malaise, and was obliged to remain in bed. After a time pruritus was experienced at one point or another, blood soon appeared at this point, and the general symptoms were relieved.

At one period the attacks occurred twice daily. The point at which the hemorrhage was about to take place became slightly tumefied and blood issued from the pores in large drops. On passing the fingers lightly over the swollen skin, which was painful, the flow of blood became accelerated. After the hemorrhage had ceased the affected area, when cleaned off, showed no change whatever, the skin appearing quite normal.

The case of Louise Lateau affords a striking illustration of one of the less unusual varieties of hæmathidrosis. She was what is called a "mystic," a young girl of strongly hysterical character and devoted to religious meditation and "ecstasies." In her case the affected areas involved those points described in the Scriptures as the marks of our Saviour's passion,—namely, the hands, feet, left side, and forehead. The hemorrhages in this case either occurred or reached their maximum on each recurring Friday, the day of our Saviour's crucifixion.

Examined on Thursday morning the surface of the back of each

hand showed a rose-colored patch, oval in shape, and about an inch in the longer diameter. A similar patch could be seen in the palm of each hand, and also on the dorsal and plantar surface of each foot.

About noon on Thursday a bulla, corresponding in size to the marks above described, made its appearance at each affected point. These bullæ were at first filled with transparent serum, occasionally tinged with blood. The subjacent and surrounding tissues were apparently unaltered; there was no redness nor turgescence.

About midnight on Thursday the blood began to appear, showing itself at first, usually, but not invariably, at a point on the left side. Within a few hours the areas upon the hands and feet began to bleed, and an area of hemorrhage also appeared upon the forehead near the roots of the hair. The hemorrhage was preceded by a rupture of the bullæ, at first followed by an exit of pure serum and immediately after by a free oozing of blood from the denuded derma. On the forehead a band of turgescient and painful skin could be seen, from which the blood issued in droplets. No bullæ appeared at this point.

After some hours the blood ceased to flow, and by Saturday the "stigmata," as they were called, had become dry, smooth, and shining, with a few minute scales of dried blood. The patient who, during the course of the attack, had been unable to move about, or help herself, was now able to go about her usual household avocations, and remained well until the following Thursday.

The cases which I have just given will serve to illustrate in a general way the chief features of hæmathidrosis. Let me now describe somewhat more systematically the various aspects and course of the affection.

The localities affected in hæmathidrosis vary in different cases, and in the same case at different times. The anterior aspect of the trunk, the limbs, the neck, face, or scalp, may be the seat of the hemorrhage. Blood may drop from the ends of the fingers or ooze from around the finger-nails, tears of blood may issue from the eyelids, or a hemorrhage from the ears may take place. In some cases one side alone may be affected. A case is reported where the right leg, thigh, arm, and chest were the seat of bleeding patches, accompanied by spasms and followed by paralysis and amaurosis of the right eye. The latter symptoms were of an hysterical character.

The few cases reported of general hæmathidrosis have not been fully authenticated, and belong apparently to the domain of legend. There is, however, no inherent impossibility of such an occurrence.

The premonitory symptoms of bloody sweat are those of general

malaise, weakness, or pain in the limbs, and elsewhere. More frequently certain localized sensations precede the flow of blood. There may be at times a dull pain, in other cases a sharp pricking sensation, or even lancinating pain in the locality about to be attacked. Sensations of pruritus or of burning pain not infrequently call the patient's attention to the part before the actual appearance of any lesion.

The seat of the pain and that of the hemorrhage are not by any means invariably identical. The former is sometimes referred to points far distant from those where bleeding is about to take place. Though nearly simultaneous, the symptoms of pain and hemorrhage are not, as has been remarked, invariably superposed. Thus, in one case reported the patient bled from the face, neck, axillæ, and chest, while violent pains were experienced in the renal or the ovarian regions. These prodromic pains are to be distinguished from those experienced at the moment of the occurrence of hemorrhage. They are profound and often violent, radiating to the neighboring parts, and assuming the character of severe neuralgia. They would seem to be seated in the nerve-trunks placed deeply beneath the skin. The painful sensations, which occur synchronously with the actual hemorrhage, are seated in the skin itself, and are exactly circumscribed by the area of the hemorrhagic lesion. Whether occurring at the seat of the hemorrhage or not, the pain is usually the first symptom to show itself, growing rapidly in intensity until the culmination is marked by the hemorrhagic outbreak. Hyperæsthesia is also a marked symptom in some cases, the sensibility of the parts becoming so exalted that the slightest touch, even a feather drawn lightly over the surface, may provoke screams of pain from the patient.

In many cases the skin becomes flushed or of a pinkish color, and the sensation of a rush of blood to the part is experienced together with tumefaction preceding the issue of blood. As a rule, in such cases, when the skin of any portion of the body becomes the seat of pronounced hyperæmia the hæmathidrosis is imminent in that locality. This does not invariably occur, however, for at times the hyperæmic condition may persist for hours and even days, and at length gradually disappear without any hemorrhagic effusion. Occasionally the congestive state may pass away under the influence of a crisis of nasal or hæmorrhoidal hemorrhage, or a violent attack of ordinary perspiration without the occurrence of hæmathidrosis.

We have seen that in some cases of hæmathidrosis the symptoms just described are wanting. In such cases there is no neuralgia, hyperæsthesia, or congestive phenomena, the blood exuding from an

unbroken and apparently healthy skin, sometimes even without the patient's knowledge.

There is a kind of analogy in this respect between hæmathidrosis and hyperhidrosis. In some cases of excessive sweating there is a precedent condition of heat and congestion, while in other instances the sweat oozes from a cold and clammy surface or from an apparently normal skin without any premonitory symptoms.

The appearances commonly presented at the actual occurrence of hæmathidrosis have, I think, been sufficiently depicted in the illustrative cases I have cited. But this picture varies in different cases. When the palms or soles are affected, where the horny epidermis is normally thick and dense, fissures may form, which take on inflammatory action and remain permanent like chaps or rhagades, opening afresh from time to time as new attacks of hæmathidrosis occur.

The symptoms preceding and accompanying an outbreak of hæmathidrosis are commonly, as may be inferred from what has been said, of an hysterical character. Extreme excitement, nervousness, spasms, etc., accompanied at times by epistaxis, hæmatemesis, and similar phenomena, not unfrequently go to make up the picture.

It is rare that a sufficient amount of blood is lost in hæmathidrosis to cause syncope, extreme weakness, or anæmia. This is a singular circumstance, because the amount lost is sometimes very considerable, as much as two or three pints at a single attack. Even although the attacks of hæmathidrosis may have lasted for years, the patient's health in many cases may continue unimpaired. The exceptions to this rule are, in some instances, those cases where the bloody sweat has occurred in previously healthy persons subjected to intense moral shock. Fatal results reported in such cases may probably be attributed to the shock itself rather than to the loss of blood.

In many cases hæmathidrosis is not the first symptom of a morbid hemorrhagic condition manifested by the patient. Ordinarily other hemorrhages, or hemorrhagic congestions, have occurred, sometimes for years, at other points occurring at more or less fixed intervals. Sometimes the manifestations of hæmathidrosis terminate, or rather replace the production of these hemorrhages; at other times the bloody sweat is only a new hemorrhagic manifestation superadded to those which had shown themselves previously.

Hæmathidrosis, although acute as regards the individual attacks, is essentially a chronic affection when regard is had to the duration of the tendency to successive outbreaks. Such outbreaks may recur at intervals during a lifetime, or may, on the other hand, cease after a few

months. A few cases, indeed, are upon record where a single attack only has been experienced. The duration must evidently depend upon the state of the patient's general constitution; any powerful modifying cause intervening may put an end to the hemorrhagic attacks, even although these may have recurred with varying frequency and severity for years.

Most of the cases of hæmathidrosis on record have occurred in adults,—that is, between the age of puberty and the beginning of old age. The affection has occasionally, however, been met with in young children and even in infants. The case is reported of an infant, three weeks of age, who, falling sick with some wasting disease, was attacked by bleeding from the surface of the left arm, lasting six days. The right arm then became affected, the child's health improving steadily, and after continuing a few days in this locality the hemorrhage ceased, and the child rapidly recovered without any relapse.

Women are more apt to be attacked by hæmathidrosis than men, and in them the affection not unfrequently occurs in connection with some suppression of the menstrual flow; not, however, as was formerly supposed, in the way of a succedaneum to the natural discharge. By far the most potent factor in the causation of the affection is that condition of the nervous system which is found in the hysterical state. A large proportion of the cases of hæmathidrosis which have been reported have occurred in hysterical individuals of either sex, and in many of these cases the outbreak of bloody sweat has coincided with the occurrence of marked hysterical phenomena, while in some cases, as that of Louise Lateau, the hæmathidrosis has taken its place in the regular category of symptoms occurring at regular intervals, such as convulsions, catalepsy, coma, etc., sometimes called *hysteria major*.

Whatever the influence which brings on an attack of hæmathidrosis, its repetition is pretty sure to bring on a recurrence of the disease, the tendency to relapse becoming more and more marked as the hemorrhagic habit, so to speak, becomes confirmed. In the case of a porcelain-worker, exposed to great heat, in whom the habit of excessive sweating, finally resulting in hæmathidrosis, became confirmed, each exposure to the heat of the furnace resulted in an attack of bloody sweat.

Violent muscular exercise, augmenting as it does the sudoral secretion, is sometimes followed by hæmathidrosis. A gentleman who devoted himself to the excessive practice of fencing sometimes observed his shirt to be tinged with blood, which was excreted with the abundant pouring out of perspiration. A young girl dancing to excess had an attack of hæmathidrosis which lasted all night. The next morning

she expired, not probably as the result of the bloody sweat, but from a metrorrhagia which occurred simultaneously.

Moral shock, as terror, may occasion hæmathidrosis. A young nun, observing a mortal combat taking place unexpectedly under her eyes, was seized with violent sweating of blood. Another subjected to violation during the sack of a city died with the symptoms of general hæmathidrosis. A man, suffering from mental overwork and worry, indulged in excessive copulation and was seized with hæmathidrosis, seated chiefly about the glans penis but also elsewhere. In this case the hæmathidrosis recurred at intervals for some months without further exciting cause. A woman subject to nephritic colic suffered from hæmathidrosis, apparently the result of the severe pain during several successive attacks, and then, the habit being established, experienced other attacks of hæmathidrosis without obvious cause.

Occasionally hæmathidrosis may occur at the crisis of a severe fever. It is also observed, I believe, as one of the symptoms of yellow fever where severe sweating has occurred.

All the causes of hæmathidrosis which have been enumerated may give rise to bloody sweat, occurring in any portion of the healthy skin. There is a certain predisposition manifested, however, in some cases to attack the weakest points, as *nævi*, *cicatrices*, etc.

The pathology of hæmathidrosis is very imperfectly understood. From one point of view it may be said that there is, strictly speaking, no such thing as a secretion of bloody sweat. In chromidrosis we have a chemically altered sweat, and also in bromidrosis and uridrosis there is the excretion of altered sweat, but in hæmathidrosis no such condition has been proved.

However, blood exudes from the mouths of the sweat-ducts preceded in some cases by an excessive outpouring of pure sweat, which gradually becomes tintured with blood, and finally gives way to an outflow of pure or nearly pure blood. The few anatomical examinations which have been made go to show that the blood enters the sweat-ducts near their point of exit. I think this points to an escape either by rupture or diapedesis from the superficial capillaries of the skin and a leakage through the epidermis surrounding the sweat-ducts.

It is known that the sweat-duct is lined with pavement epithelium up to the point at which it penetrates the heavy layer of the epidermis. Beyond this point no epithelial lining can be traced. The sweat as it exudes from the duct is ordinarily lost in the loose shingle-like arrangement of the epidermis of the horny layer, and only pours out upon the surface where the excretion becomes excessive. In the exam-

inations which have been made scattered blood-corpuscles have been found near the point where the sweat-duct enters the horny layer.

There are certain analogies between purpura and hæmathidrosis which I may notice in passing.

The two affections occasionally occur together. Some of the causes producing one, as fright, shock, etc., are also found at times producing the other. The appearance of a purpuric extravasation at a given point is often preceded by acute neuralgic pain, and, as I have pointed out, pain referred to the part often presages the occurrence of hæmathidrosis at a given point.

It has been asserted that hæmathidrosis is often connected with the hemorrhagic diathesis, but examination of the reported cases shows that this is not the case. I cannot recall any well-authenticated instance in which hæmathidrosis coincided with the hemorrhagic diathesis. One or two such cases may have been observed among the scores of recorded cases of hæmathidrosis and the hundreds of hemorrhagic cases of which we have descriptions.

That there is some close connection between certain perturbations of the nervous system and the occurrence of bloody sweat is self-evident. In what manner the cause and effect are connected we do not as yet know. Doubtless the same agency which provokes perturbations of cutaneous sensation, contractions, joint lesions, etc., also gives rise to hæmathidrosis, and when the cause of one is discovered that of the other will not long remain unknown.

It might be supposed that the diagnosis of hæmathidrosis would be most easy. The spontaneous appearance of drops of blood upon the skin is sufficiently characteristic. These drops form with variable rapidity, and are grouped more or less closely in different cases. In the slighter cases droplets of red sero-sanguinolent fluid form slowly and are seen sparsely scattered about. In more severe cases the droplets are closely aggregated, and frequently commingle to form little rivulets of blood flowing over the skin. When the attack of hæmathidrosis is over, the skin at the affected point in most cases shows no trace of any morbid lesion.

The frequent recurrence of hæmathidrosis in the same individual will give rise to the expectation of a fresh attack whenever local hyperæmia shows itself.

Hæmathidrosis, in its first stage, may easily be mistaken for slight erythema. The congestion of the skin which occurs at the point where the hæmathidrosis is about to appear, and even after bleeding is established, the sensation of heat and pruritus, often experienced by patients

at such points, are symptoms which are common to the affection under consideration and to various superficial inflammatory affections of the skin. The cutaneous congestion is sometimes so considerable at the commencement of some hæmathidroses that there is a certain amount of tumefaction of the skin, and the subcutaneous cellular tissue immediately underlying. In such cases it would be difficult to recognize by the appearance only of the affected part whether an hæmathidrosis or an inflammatory lesion were about to develop. It must be remembered, however, that in many cases of hæmathidrosis this part of the skin is scarcely sensitive under pressure, the patient only experiencing some heat and a dull feeling of weight. There is nothing more than a hyperæmia of the skin. When, however, superficial inflammation is about to supervene, a more or less acute and burning pain, often pruriginous, shows that we have to do with something else than the earlier stage of hæmathidrosis.

Cutaneous hyperæmia in the cases under consideration is not always followed by hemorrhage; sometimes the former alone constitutes the only eruption. Such cases must sometimes be distinguished from hemorrhagic infiltrations of the derma. Hyperæmic redness of the skin disappearing under exploratory pressure to return immediately afterwards characterizes what may be called the prehemorrhagic stage of bloody sweat, while the patches resulting from the presence of blood infiltrated into the substance of the skin never disappear under pressure. The color of the skin in a hyperæmic condition is bright red, which melts away at its limits by successive shades to a rose tint; the color of the skin covering hemorrhagic patches is purplish or violaceous, passing after some days into a violet-yellow, and then to a clear yellow. These patches also are sharply circumscribed.

The prognosis of hæmathidrosis is favorable. Very few cases having a fatal termination have been reported. The course of the affection may, however, be prolonged over many years by repeated relapses. It is not likely that many deaths have ensued from the immediate effects of hæmathidrosis, but it is possible that the long persistence of the affection may give rise in some cases to a state of weakness which may favor the attack of intercurrent disease.

The treatment of hæmathidrosis must usually be based upon the patient's general condition, and directed to allaying the attack of the moment and fortifying the patient's system against subsequent ones.

LUPUS.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY HENRY W. STELWAGON., M.D.,

Clinical Professor of Dermatology in Jefferson Medical College, Philadelphia.

GENTLEMEN,—It is generally accepted to-day that lupus vulgaris is a cutaneous tuberculosis,—a disease of the integumentary tissues due to the invasion of its parts by the tubercle bacillus. There are several varieties of cutaneous tuberculosis, clinically speaking, due to the same cause, all of which are usually comprised under the one general term “scrofuloderm.” I wish to speak of the variety known as lupus vulgaris, or lupus, well-developed cases of which are exhibited in Figs. 1, 2, and 3, from patients under the age of sixteen, in whom the disease had already existed for a number of years. This disease is common in some parts of the world, as, for example, Austria, and somewhat infrequent in others, as, for instance, our own country. It usually has its beginning in the first periods of life, as in childhood and early adolescence; to this, however, there are exceptions, although it is rare to see it beginning after middle life. The disease is, as a rule, slow in its course, especially at first, often taking several years or longer before the area involved reaches the size of one or two square inches. In its earliest stages it consists of an insignificant flat infiltration or group of pin-head to small-pea-sized infiltrations of a yellowish or brownish-red or apple-butter color, with or without a slight or moderate tendency of the overlying epiderm to exfoliate. Sooner or later, in the large majority of the cases, in the oldest part of the patch or area destructive changes take place and shallow ulcerations result. In the course of weeks or several months such ulcerative changes are followed by cicatrization, usually of a somewhat hard, tough, and fibrous character. During this time the diseased area is very gradually, but almost imperceptibly, becoming larger by the appearance of the same characteristic flat, papular, or tubercle-like, apple-butter colored deposits, either immediately continuous with the border of already formed

lesions or groups of lesions, or appearing as closely outlying islets; if the latter, new foci subsequently fill in the interspaces, and they become thus finally more or less confluent with the original area. In rare instances the ulcerations are the seat of papillomatous exuberances, as shown in Fig. 4.¹ In other cases, instead of ulcerations, the older lesions or patches may exfoliate and partly or completely disappear in this manner, and partly, doubtless, by absorption, leaving a somewhat atrophic skin paler or darker than the normal integument. In many instances more or less continued exfoliation, slight in character, is to be seen in association with ulcerating lesions or patches; there is, however, never any pronounced scaliness. In the atrophic or scar tissue new foci of disease may again appear from time to time, usually isolated and with very little tendency to confluence. Bone tissue is rarely, if ever, invaded in this form of cutaneous tuberculosis. The disease, with at times periods of comparative or complete quiescence, steadily keeps on, although its progress from month to month is scarcely perceptible. In a patch or area of lupus of some years' standing, therefore, you will expect to find scarring or atrophy, deposits or infiltrations made up usually of confluent lesions, with a tendency to slight exfoliation or active ulcerations or both, and commonly some outlying islets or foci. About the region of the nose, a not uncommon site, considerable disfigurement results, both from the active manifestations and from the resulting cicatricial contractions. The same ensues when the neighborhood of the eye or mouth is involved, in the former ectropion is not an uncommon consequence.

That the disease is due to the tubercle bacillus there is but little, if any, doubt; and that it is inoculable, and in that sense contagious, follows as a natural inference. In my own experience, among other examples of probable communication, I may mention two instances of a child, frequently handled and fondled by a consumptive relative, developing in each instance the disease in a small patch upon the face; another of a young adult, as shown in Fig. 5, with lupus at the seat of vaccination upon the upper arm, making its appearance shortly after that operation, in early childhood. Such examples, I am sure, might be multiplied if the experience of other observers was given. It is true that in our own country tuberculosis of the lungs is an extremely frequent disease and cutaneous tuberculosis relatively uncommon, the cutaneous tissue being apparently unfavorable soil for its

¹ For a full report of this case see *Journal of Cutaneous and Genito-Urinary Diseases* for November, 1892.

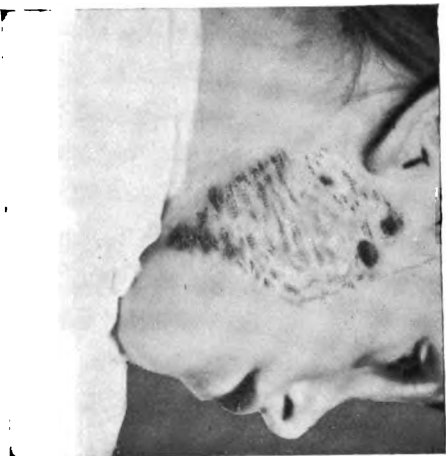


FIG. 1.



FIG. 2.

Lupus caeca.



FIG. 3.

development; such a great discrepancy, which, however, is not so marked in some other countries, is difficult to explain. It will possibly admit of explanation as our knowledge of etiological factors becomes widened.

In the diagnosis of lupus considerable difficulty may arise, especially with the student and general practitioner. The ulcerative diseases of the skin likely to be met with are epithelioma, syphilis, and lupus vulgaris, and really the only three which need concern the general worker in the differentiation. It is true that in exceptional cases of lupus erythematosus a mistake might be made, but, as a rule, in this latter disease the symptoms are materially different. Epithelioma, especially of the superficial or rodent ulcer type, occasionally bears resemblance, but in this the lesion or area is usually single, begins commonly late in life, has a peculiar pearly roll-like border, which with other symptoms, and usually a clear history, will aid in differentiating. The real difficulty lies in distinguishing lupus from the tubercular syphiloderm. In fact, these two diseases—lupus and tubercular syphiloderm—are often strikingly similar in their symptomatology. Even to the eye of a trained specialist this resemblance to syphilis, as well illustrated by Figs. 4 and 6, showing respectively papillomatous lupus of the nose, and serpiginous and circinate lupus of nose and adjacent parts, is at times puzzling, and exceptionally sufficiently so as to lead to possible error. There are differences, however, which as a rule will serve to prevent mistakes. The tubercular syphiloderm is much more rapid in its course compared to lupus,—that is, in a given time, say a few years, much more territory will be covered by syphilis than by lupus. A silver-dollar-sized area for lupus may mean several years' duration, but for syphilis it usually means a few months or even less. The tubercular syphiloderm, moreover, commonly makes its appearance for obvious reasons in middle or late life, whereas lupus usually has its beginning in childhood and early adolescence, and rarely after the age of thirty. The common site of lupus is some part of the face, and while it may appear elsewhere independently, as a rule, when occurring upon other parts it is in conjunction with the disease upon the face. Syphilis, on the other hand, occurs upon almost any part independently, although the face is not an uncommon site. The color of syphilis is a darker red, more of a coppery-red, whilst that of lupus is more of a yellowish-red or brownish-red color. Crescentic and serpiginous groupings, crescentic and horseshoe-shaped ulcerations, are usual in syphilis and uncommon in lupus. The purulent discharge is, as a rule, moderately or profusely abundant in the ulcerations of syphilis and scanty or absent in lupus. The ulcerations of syphilis

may be superficial or deep, those of lupus are almost invariably superficial. In the former disease bone may share in the destruction; in the latter such destruction is rarely, if ever, seen. The cicatricial formation in syphilis is usually soft, and compared to the sometimes preceding extensive ulceration comparatively insignificant; in lupus, on the other hand, the scar is often thick, dense, and tough. Between the non-ulcerating forms of lupus and of syphilis the differentiation is apt to be even more difficult than in the more common or ulcerating types. The history of the case is sometimes valuable; in syphilis, evidences or history of preceding characteristic phenomena of that disease may usually, but by no means always, be elicited. In lupus, not infrequently the patient comes of a tuberculous family, with a history of consumption in the immediate or collateral branches; sometimes the patient himself, or herself, will give other evidences of a scrofulous character, such as the scars of a cervical adenitis, marks of a keratitis, or even tuberculous involvement of the lungs. Often, however, both in tubercular syphiloderm and in lupus a history bearing upon the cutaneous disease present is wholly lacking or without value. Admitted respectability of a patient, while of some import in the consideration of the case, should not be allowed to have too much weight. Syphilis is often innocently contracted, as, for instance, through the marital relation; and in many cases the early symptoms may be so mild as to escape observation, the tubercular syphiloderm constituting the first eruption recognized by the patient. In my experience this factor—the admitted respectability of the patient—is one of the most common causes for a mistake upon the part of the general practitioner, such cases being almost invariably regarded as lupus. Another fact not to be lost sight of is that the tubercular syphiloderm is a not uncommon disease, and that lupus is comparatively rare, and that if the practitioner is going to allow himself any latitude it should be to consider a tubercular eruption with atrophic or ulcerative tendencies to be syphilitic rather than that of lupus, it matters not in whom it may occur, unless he has very positive reasons for considering the contrary. It must be admitted that in not a few instances the several differences mentioned as distinguishing these two cutaneous diseases are practically lacking or sufficiently so as to make a positive diagnosis without further observation of the case almost impossible. In such instances, and in fact in all except those cases in which the diagnosis can be made without difficulty and with certainty, the general physician is much safer in withholding an opinion or expressing himself guardedly, and in the mean time treating the patient as if the disease were of specific origin.

With rare exceptions the use of the ordinary antisymphilitic constitutional treatment, with no external application or with a placebo, such as vaseline or cold cream locally, will make a material impression in a week or ten days if the case be of a syphilitic nature, whereas the result of such constitutional treatment in lupus would be essentially *nil*.

As to the prognosis of lupus much depends upon the age of the patient, duration of the disease, extent of territory involved, and the thorough co-operation of the patient. Small beginning areas of the disease, especially in the young, are usually readily remediable, and, as a rule, show no tendency to relapse if treatment has been sufficiently thorough. The same holds true with such small areas in the adult; in areas of larger size favorable permanent results are usual, possibly after one or more relapses. In more extensive cases persistent energetic treatment promises a final result even when the disease, as it often does, crops out again and again in the scarred tissue or at the edge of the original area. In more extensive cases, as, for instances, when a greater part of the face is involved, the prognosis should be guarded, as even with well-directed and persistent treatment the disease is apt to be rebellious and recurrent, and patients will usually finally desist after repeated disappointment and give up the battle. In some instances, too, of this disease, when the area involved is comparatively small, persistent relapses and rebelliousness are observed. Fortunately, lupus is not common in this country, and does not thrive as well here as elsewhere. Climatic, dietetic, hygienic, and probably other not so well understood conditions which prevail, render our people less susceptible to its ravages, and when it does occur it is noted to be, as a rule, less aggressive and much more yielding than is observed in those countries where the disease is more common.

The treatment of lupus has in view a supervision of the patient's general health and the employment of local measures having as an object destruction or removal of the diseased tissue. Judged by my own experience, cod-liver oil, in small or moderate doses long continued, seems to have in some cases a material influence in limiting the spreading or active tendency of the disease, and in aiding towards making the results from local treatment more permanently favorable,—in other words, rendering the soil a less favorable habitat for the bacillus. Other tonics should also be prescribed if indicated. The use of tuberculin is not to be advised, except in persistent cases and only after other measures have repeatedly failed, and then with caution, as its employment is not without danger.

As to local measures—the essential part in the mangement of lupus

—up to several years ago I had treated all cases destructively, either by means of caustics, the cautery, the curette, and excision, or a combination of two or three of these methods. Recently, however, following the suggestions of Doutrelepont and White, I have, in the more extensive cases, tried mercurial applications, and in some instances with good results. The mercurial application was that employed by the gentlemen referred to,—corrosive sublimate in lotion or ointment, preferably the latter, of the strength of one-half to four grains to the ounce. Later, however, I have made use, with apparently better results, of an ointment of oleate of mercury,¹ consisting of one to three drachms of the ten-per-cent. oleate to sufficient simple cerate or equal parts of simple cerate and lard to make up the ounce. The strongest application which falls just short of producing irritation should be used. If the ulceration is slight or lacking, the ointment is to be rubbed in for five to fifteen minutes gently but thoroughly, being repeated twice daily. A greater effect results if, in addition to rubbing it in, it be spread upon lint, or such material, and kept applied as constantly as possible. If the surface is considerably ulcerated the ointment is to be applied in this latter method only, or the parts kept smeared with it, until the ulcerated surfaces skin over; subsequently it is to be rubbed in in the same manner as suggested above. That the effect is not uniformly satisfactory one soon learns, but its effect in some cases is so favorable as to justify me in suggesting it to you for trial, especially as a beginning method of treatment. Even in those cases in which a beneficial influence is exerted, its effect is usually slow, and several weeks' or months' application must be enjoined before a result is achieved. The two figures—6 and 7—of a youth, aged sixteen, with a lupus vulgaris of some years' duration, show the effect of this method of treatment; conjointly with this he has been taking cod-liver oil and the hypophosphites.

Ordinarily, however, you will soon find that mild methods exert but little influence, and in cases in which time is a consideration, it will be best to adopt destructive measures from the start. Various enucleative or operative methods are in vogue, all having the one object of destruction or removal in view, and each has its advocates. I will mention only those which I have been gradually led through experi-

¹ In looking over the literature of the subject, when revising this for publication, I find that Brooke, of Manchester, England, has been using, with some success, a compound ointment containing the oleate of mercury: \mathcal{R} Pulv. zinci oxidi, pulv. amyli, aa $\mathfrak{z}\text{ii}$; vaselin. alb., $\mathfrak{z}\text{ss}$; hydrarg. oleat. (five per cent.), $\mathfrak{z}\text{i}$; ac. salicylici, gr. xx ; ichthyol., $\mathfrak{m}\text{xx}$; ol. lavandulæ, q. s. \mathcal{M} . \mathcal{Ft} . ungt.

FIG. 4.



FIG. 5.



FIG. 6.



FIG. 7.



Lupus cases.

ence to believe to be the most satisfactory. The selection of method, to a certain extent at least, is often influenced by the desires or fears of the patient. There are those who will not permit the use of operative procedures. For such more especially caustic applications are to be advised. The mildest caustic, which is usually painless and often efficient, is pyrogallic acid. It is to be employed in the form of a stiff ointment, such as—

R Acid. pyrogallici, ℥ii;
Empl. resinæ, ℥ii;
Cerat. resinæ, ℥iv. M.

This is spread upon patent lint or any other suitable material, and kept closely applied to the parts, changing to a fresh plaster twice daily. At each renewal the parts are wiped off gently with a piece of soft linen or cotton, and any loose skin, crust, scale, or slough thus removed. At the end of five to eight days it is usually noted that a superficial slough or a slough of variable thickness has formed, which may be more or less adherent. This, if but slightly adherent, may be rubbed off or picked off; if firmly adherent,—and this is more commonly the case,—poultices are to be applied till it softens and comes away, which may require several hours or a day. The parts are then gently washed with soap and water, rinsed, and wiped dry, and the pyrogallic acid ointment reapplied; and so on till the destructive action has been deemed sufficient. A course of such treatment usually requires from two to four weeks. After removing the final slough a carbolized resin cerate, or an ointment of pyrogallic acid of one- or two-per-cent. strength, may be used and healing allowed to take place. Others follow this treatment, as I have also done in some instances, with an ointment made up of equal parts of mercurial plaster and petrolatum, or with pure mercurial plaster. After thorough healing it may be seen that in places the disease is still persistent, or soon afterwards new foci reappear in the scarred tissue. The same method is to be resumed, usually for a shorter period. Or when the new foci are small and isolated the pyrogallic acid may be applied in collodion of ten- to twenty-per-cent. strength; this is painted on two or three times, twice daily, for several days, and then discontinued till the coating which has formed drops off or is easily picked off, when the paintings may be resumed. Two or three repetitions will usually produce sufficient destruction, and the after-treatment is the same as before.

Another most excellent and searching caustic which I have used is arsenic; its application is, however, painful and usually attended with

a good deal of oedema and erysipelas-like swelling. In order to prevent the possibility of toxic effect from absorption, not more than a square inch should be treated at one time. It is therefore particularly adapted for a small patch of disease. It is applied mixed with powdered acacia, one part of arsenious acid to three or four parts of acacia; at the time of application sufficient water is added to make a somewhat stiff paste. This is spread thickly over the diseased area, from which the crusts or scales have been previously removed, and a piece of patent lint placed over it. The paste dries both to the skin and to the lint, forming a firm adherent dressing. At the end of several hours or half a day the application becomes somewhat painful, and considerable swelling may ensue; after forty-eight hours poultices are applied, and continuously so, till the plaster and slough come away, which may require a fraction of a day or several days. A thoroughly clean ulcer or ulcers result, which are to be subsequently treated in the same manner as in the after-treatment with pyrogallic acid. This remedy is used in Vienna in the form of an ointment made up of—

R. Ac. arseniosi, gr. x;
Cinnabar. factit, ʒss;
Ung. aquæ rosæ, ʒss. M.

It is applied more freely as to extent than the plaster mentioned above. It is kept constantly applied, changing daily, and continued until sufficient destruction has resulted, usually two or three days. The great advantage of arsenical applications is that only the diseased tissue is destroyed, it having practically or relatively no action upon sound or scar tissue. The same holds true, to a less extent, however, with pyrogallic acid. As with all methods of treatment, the arsenical applications may have to be repeated one or more times before a permanent result is reached.

Probably the most common method here employed, and which is equally favored by others, is that by the curette followed by cauterization. Etherization is usually necessary. The parts are thoroughly curetted, the edges being well looked after; immediately after the curetting caustic potash is applied and allowed to act for some seconds, or a minute or so, and then dilute acetic acid or vinegar dabbed on to limit its further action. The treated surface is then dressed with carbolized oil or with the ointment of mercurial plaster already referred to. Instead of the cauterization with caustic potash the strong (twenty-five per cent.) pyrogallic acid ointment may be used for several days, followed by poulticing and the carbolized resin cerate ointment. An-

other method sometimes employed is that by excision; this is only applicable, however, when the diseased area is small and sharply defined, and occurring where the integument is loose and yielding, as, for example, the cheeks and forehead. After excision the parts may be brought together by stitches, if necessary, or by adhesive plaster, and dressed antiseptically. Another method of destruction is by means of the galvano-cautery; it is painful, however, and the scarring is more apt to be keloidal and disfiguring. Another method which may be adopted when the disease is about the nose, and the least possible disfigurement is desirable, is that by linear scarification. The parts are thoroughly gone over with close parallel incisions reaching down through the diseased tissue, and then the area is cross-tracked in the same manner; the parts are then dressed with the ointment of mercurial plaster and petrolatum, or pure mercurial plaster, till healing takes place. The surface is then gone over again in a similar manner at intervals for several repetitions. The disease is crowded out, so to speak, and the cicatricial tissue-formation is satisfactory, and but slightly disfiguring. This method is slow, and the necessity of several or more repetitions renders it unacceptable to the average patient. Nor am I convinced that it has any superiority as to a cosmetic result over the method by curetting and supplementary cauterization.

There are other methods than those just detailed to you, which, if as energetically persisted in, would be equally promising as to results, but the several described, especially the three,—pyrogallie acid treatment, arsenical paste or ointment method, and the curetting with supplementary cauterization,—are those which I use at the present time almost exclusively, and with fair degree of success.

INDEX TO VOLUME II.

(SIXTH SERIES.)

A.

- Abdomen, preparation of, for operation, 242.
 Abdominal incision in the treatment of ovarian cyst, 284.
 rings, the closure of, in herniotomy, 43.
 Abscess, cerebral, in chronic otitis media, 308.
 cervical, from thrombosis of the internal jugular vein, 307.
 multiple, of the kidney, 194.
 of the brain, a cause of optic neuritis, 294.
 of the broad ligament, 93.
 of the cæcum, 94.
 of the lung in pneumonia, 132.
 perirenal, following appendicitis, 94.
 A. C. E. mixture in anæsthesia, 211.
 Acetabulum, fracture of the, a case of, 229.
 Acetanilide in the treatment of eczema, 79.
 Acetate of zinc in gonorrhœa, 60.
 Acid, pyrogallie, in the treatment of lupus, 347.
 Acromegaly, x-ray photography in the diagnosis of, 6.
 Adenitis, cervical, in scrofula, 344.
 Adenoid growths of the naso-pharynx, the diagnosis of, 319.
 the treatment of, 321.
 vegetations of the naso-pharynx in their relation to ear-disease, 326.
 Administration of quinine in malaria, 14.
 in whooping-cough, 18.
 Albolene in eczema, 77.
 Alcohol as a cause of optic neuritis, 298.
 as an antiseptic, 328.
 in combination to produce anæsthesia, 211.
 in eczema, 76.
 -lamp sterilizer, 231.
 -poisoning, treatment of, 24.
 Alexander's operation for shortening the round ligaments of the uterus, 85.
 Alum in the treatment of gonorrhœa, 60.
 Aluminium in x-ray photography, 2.
 Ammonia as a renal stimulant, 120.
 Amputation of the leg for gangrene, 206.
 technique of, 207.
 Anæmia, a case of, 136.
 as a cause of optic neuritis, 294.
 from mouth-breathing, 322.
 Anæsthesia, artificial respiration in profound, 209.
 Anæsthesia, local, in brain disorder, 158.
 suspended animation under, 209.
 Anatomical relations of the mastoid cells, 316.
 Aneurism of the aorta, latent, 97.
 treatment of, 49.
 Aneurism, the diagnosis of, 98.
 the symptoms of, 97.
 due to pressure, 99.
 Angina pectoris, the different forms of, 102.
 the symptoms of, 103.
 Animation suspended in profound anæsthesia, 209.
 Anteflexion of the uterus, physiological, 279.
 Antisepsis in laparotomy, 274.
 Antrum and mastoid cells, the topographical anatomy of, 314.
 Aorta, latent aneurism of the, 97.
 Aortic aneurism, indirect effects of, 54.
 obstruction, the diagnosis of, 148.
 obstructive murmur of, 148.
 Apex beat, normal position of the, 135.
 Apparatus for x-ray photography, 3.
 Appendicitis, conditions with which it may be confounded, 96.
 foreign bodies a cause of, 217.
 indications for operation in, 94, 249.
 the diagnosis of, 91, 217.
 the operative treatment of, in children, 247.
 the sequelæ of, 94.
 the statistics of cases of, 95.
 the symptoms of, 94.
 traumatic, 214.
 Appendicular colic, the significance of, 217.
 Arsenic in malaria, 13.
 in the treatment of lupus, 347.
 Arthropathies, complications of, 168.
 in locomotor ataxia, the diagnosis of, 164.
 the symptoms of, 165.
 Arthropathy, definition of, 160.
 Ascites, the spontaneous relief of, 118.
 three cases of, 118.
 Aspiration in hydro-pneumothorax, 114.
 in pleural effusion, 138.
 of ovarian cyst, the mechanism of, 272.
 Asthma in brain disorder, 156.
 Astringents in gonorrhœa, 60.
 Asymmetry of the chest in pleural effusion, 137.
 Atheroma of the coronary arteries in angina pectoris, 103.
 Athetosis, 158.

- Atrophy, muscular, of the forearm, 169.
 of ovarian cyst following puncture, 272.
 of the optic nerve in retrobulbar neuritis, 296.
- Atropine in opium-poisoning, 27.
 in the treatment of shock, 207.
 the action of, on the heart, 27.
- Auscultation in hydro-pneumothorax, 115.
 in lobar pneumonia, 142.
 in pleural effusion, 138.

B.

- Balsam of copaiba in the treatment of gonorrhoea, 58.
- Bandage after herniotomy, 45.
 suspensory, in the treatment of gonorrhoea, 60.
- Barium platino-cyanide in x-ray photography, 4.
- Basham's mixture of iron as a tonic, 211.
- Bassini method of performing herniotomy, 45.
- Bassini's radical cure of hernia, 225.
- Baths in the treatment of cardiac affections, 35.
- Benzoic acid in eczema, 76.
- Bicarbonate of sodium in eczema, 76.
 solutions in sterilising instruments, 231.
- Bichloride of mercury solutions in surgical technique, 231.
 in the treatment of urethritis, 59.
- Bicycle riding a cause of appendicitis, 214.
- Biliary calculi a cause of appendicitis, 217.
 fistula following the rupture of an hepatic abscess, 122.
- Binder, the use of, after aspiration, 272.
- Bisulphate of quinine in malaria, 14.
- Blaud's pills in anæmia, 10.
- Bloodletting, general, in the treatment of aneurism, 55.
- Blood-supply of ovarian tumors, 274.
- Bloody sweat, 332.
- Bone disease, x-ray photography in the diagnosis of, 6.
- Boracic acid in the treatment of eczema, 76.
 solutions in trachoma, 301.
- Brain disorder in children, signs to observe in, 154.
 tumor, diagnosis of, by x-rays, 5.
 tumors, the frequency of optic neuritis in, 293.
 statistics of, 293.
 the symptoms of, 291.
- Bran poultice in the treatment of eczema, 76.
- Brandt's method of treating retrodisplacements of the uterus, 85.
- Brandy in exhaustion, 120.
- Bright's disease as a cause of optic neuritis, 294.
- Bromidrosis, 338.
- Bullet in hand, the localizing of, 5.

C.

- Cachets of bisulphate of quinine in malaria, 14.
- Cachexia of ovarian cyst, 282.

- Cæcum, abscess of the, 94.
 inflammation of the, 213.
- Caffeine in the treatment of alcohol intoxication, 24.
 of opium-poisoning, 24.
- Calamine powder in the treatment of eczema, 76.
- Calcareous degeneration of the pedicle of ovarian tumors, 276.
- Calcium tungstate in x-ray photography, 4.
- Calculus, renal, 194.
- Calomel in the treatment of eczema, 79.
- Camphor as a parasiticide, 28.
 as a stimulant, 29.
 for the relief of itching in eczema, 77.
 in the treatment of collapse, 30.
 solution of, in sweet oil for hypodermic use, 29.
- Cancer of the cervix uteri, 252.
 of the uterus, the diagnosis of, 256.
 the treatment of, 260.
- Canthoplasty for entropion, 304.
- Capillary dilatation from nitro-glycerin, 24.
- Carbolic acid in the treatment of gangrene, 206.
 solutions in eczema, 78.
- Carbolized resin oerate in the treatment of lupus, 347.
- Carbon bisulphide, a cause of optic neuritis, 298.
- Carbonic acid gas in the treatment of cardiac affections, 35.
- Cardiac compensation, the restoration of, by rest in bed, 33.
 disease, a series of cases of, 31.
 the etiology of, 68.
 the routine treatment of, 145.
 the treatment of, 68.
- dulness, diminution of, by the use of a saline bath, 36-37.
 in a case of aortic aneurism, 53.
- failure, the treatment of, 24, 54.
- ischaemia as a cause of angina pectoris, 104.
 nutrition, the mechanism of, 104.
- Caries following middle-ear disease, 330.
- Catgut sutures in herniotomy, 227.
- Catheter for urethral injections, 59.
- Caustic potash in the treatment of lupus, 348.
- Caustics in the treatment of lupus, 346.
- Cautery in the treatment of lupus, 346.
- Cerebral abscess in chronic otitis media, 308.
 fossa, middle, relation to mastoid sinuses, 315.
 reinforcement in brain disorder, 157.
 vomiting in brain disorder, 156.
- Cervix uteri, cancer of the, 252.
- Cherry-stones a cause of appendicitis, 217.
- Children, brain disorder in, 154.
 the operative treatment of appendicitis in, 247.
- Chill, initial, in pneumonia, 127.
- Chills in malaria, the etiology of, 11.
- Chlorate of potash as a tonic, 211.
- Chloride of zinc in the treatment of uterine cancer, 263.
- Chocolate-colored liquid of ovarian tumors, 283.
- Choked disk, the symptoms of, 292.
 theories to account for, 292.
- Chordee in gonorrhoea, 58.

Chorea, characteristics of, 157.
 Chorion, hydropic transformation of the, 265.
 Chromidrosis, 338.
 Cicatrization following lupus, 341.
 Cinnabar in the treatment of lupus, 348.
 Circulatory troubles, their relation to twisting of the pedicle of ovarian tumors, 272.
 Circumcision, a case of, 222.
 forceps for, 223.
 Coagulation of the blood on metallic wire introduced into the aneurismal sac, 55.
 Cocaine, collapse from the use of, 28.
 in circumcision, 222.
 in naso-pharyngeal examinations, 327.
 in the treatment of trachoma, 301.
 in tonsillotomy, 324.
 Cod-liver oil in anæmia, 321.
 Colliotomy for retrodisplacement of the uterus, 86.
 posterior vaginal, 285.
 Collapse in hemorrhagic pancreatitis, 107.
 the treatment of, 24, 90.
 Colles's law in syphilis, 185.
 Collodion and pyrogallie acid in the treatment of lupus, 347.
 Congenital form of uterine displacement, 82.
 hernia, a case of, 46.
 Consolidation stage of lobar pneumonia, 142.
 Consumption in its relation to lupus, 342.
 Cornea, ulceration of the, in trifacial disease, 155.
 Coronary arteries, stenosis of the, in angina pectoris, 105.
 Corrosive sublimate in the treatment of lupus, 346.
 Coughing, a sign of danger in aspirating, 117.
 Cranial nerves, motor action of, 155.
 Crisis in pneumonia, 128.
 Crookes's tubes in x-ray photography, 2.
 Cryptoscope of Salvioni, 4.
 Cubebs in the treatment of gonorrhœa, 58.
 Curette for aural polypi, 330.
 in the treatment of lupus, 346.
 Cyanosis in cardiac disease, 31, 64.
 Cystic hydrocele of the cord, a case of, 48.
 Cysts, ovarian, torsion of the pedicle in, 271, 287.
 puncture of, in torsion of the pedicle, 272.
 Czerny's operation for the cure of hernia, 43.

D.

Decidua, relation of, to hydatiform moles, 267.
 Delusions of persecution in paranoia, 175.
 Dermatol for antiseptic dressings, 223.
 Dermatorrhagia, 332.
 Dermoids, torsion of the pedicle in, 271.
 Diabetes as a cause of optic neuritis, 294.
 Diagnosis between mastoid suppuration, lateral sinus thrombosis, and septic meningitis in chronic otitis media, 306-308.
 differential, of cardiac murmurs, 149.
 Diaphoretics in the treatment of optic neuritis, 298.
 Diarrhœa in brain disorder, 156.
 of constipation, 214.
 Diet in the treatment of cardiac disease, 73.
 restricted, in the treatment of aortic aneurism, 50.

VOL. II. Ser. 6.—23

Diet, restricted, in the treatment of chronic follicular tonsillitis, 321.
 Digestive disturbance in eczema, 75.
 Digitalis as a renal stimulant, 120.
 in cardiac disease, 32, 145.
 in cardiac failure, 25, 54.
 Diphtheria, prophylaxis of, 322.
 Diplococcus of Fränkel in pneumonia, 125.
 Dislocation of joints in arthropathy, 166.
 Displacement of the tumor in ovarian cyst, 282.
 Dusting-powders in the treatment of eczema, 77.
 Dysentery a cause of typhlitis, 216.
 Dyspnoea in aneurism of the aorta, 97.
 in cardiac disease, 31.
 in hydro-pneumothorax, 115.
 in hydrothorax, 139.
 in lobar pneumonia, 141.

E.

Ear, disease of the, in brain disorder, 156.
 in its relation to naso-pharyngeal adenoid vegetations, 326.
 Eczema in irreducible hernia, 202.
 the symptoms of, 74.
 the treatment of, 74.
 Effusion, pleuritic, in pneumonia, 132, 134.
 purulent, in pneumonia, 132.
 Electricity in the treatment of shock, 23.
 in x-ray photography, 3.
 Electrified bodies, the discharge of, in x-ray photography, 1.
 Electrolysis in the treatment of aneurism, 55.
 Embolism, cerebral, from aortic aneurism, 101.
 Emphysematous breathing in hydrothorax, 139.
 Empyema following appendicitis, 94.
 Endometrium, disease of the, 254.
 Enemata, nutrient, the preparation of, 93.
 of quinine in whooping-cough, 18.
 Ensiliform cartilage, murmurs in the neighborhood of, 149.
 Entropium, the treatment of, 304.
 Epigastric pain in pancreatitis, 107.
 Epilepsy, the cause of, 29.
 Epitrochlear glands, enlargement of the, in syphilis, 236.
 Erysipelas, the symptoms of, 74.
 Eustachian tube, anatomy of the, 314.
 orifices of the, 329.
 Exanthemata as a cause of optic neuritis, 294.
 Exercise in the treatment of cardiac affections, 34.
 Exostoses, multiple, the diagnosis of, 6.
 Expectoration in pneumonia, 129.
 Experimenters in x-ray photography, 7.

F.

Facial nerve, canal for the, 315.
 paralysis of the, 155.
 Facies of twisted ovarian pedicle, 280.
 Fæcal accumulations a cause of typhlitis, 214.
 concretions a cause of appendicitis, 217.
 Fatty degeneration of the pedicles of ovarian tumors, 276.
 heart, a case of, 127.

Femoral hernia, 225.
 vein, the relation of, to the femoral canal, 226.
 Femur, fracture of the neck of, 228.
 Fibroid tumor of the uterus, 289.
 Finger protector for the treatment of adenoid growths of the naso-pharynx, 319.
 Flagellation in shock, 23.
 Fluorescence from zinc and sulphur crystals, 2.
 Fluoroscope of Edison in x-ray photography, 4.
 Follicular tonsillitis, chronic, 321.
 Foreign bodies as the cause of appendicitis, 217.
 in intestine, a case of, 5.
 in the hand located by x-ray photography, 5.
 Fowler's solution in anaemia, 10.
 Fracture as a complication of arthropathy, 168.
 of the neck of the femur, 228.
 Fractures, ununited, x-ray photography in, 6.
 Fränkel's diplococcus in pneumonia, 143.
 Fremitus, increase of, in pneumonia, 125.

G.

Gallic acid in tonsillitis, 323.
 Galvanization in shock, 23.
 Gangrene of the foot and ankle, amputation of the leg for, 206.
 of the lung in pneumonia, 132.
 Gangrenous odor of fluid from ovarian cyst, 283.
 Gargle for tonsillitis, 324.
 Gastric catarrh in malaria, 15.
 Gastro-duodenal inflammation in pancreatitis, 112.
 Glandular involvement of the pelvic and retroperitoneal lymphatics in cancer of the cervix uteri, 254.
 Glass, diagnosis of the presence of, by the x-rays, 5.
 Glycerin tampons in salpingitis, 287.
 Gonorrhoea, the complications of, 58.
 the treatment of, 57.
 Grandiose ideas in paranoia, 175.
 Granulation polypi from middle-ear disease, 330.
 Grating sound in arthropathy, 168.
 Grindelia robusta, fluid extract of, in the treatment of eczema, 78.
 Grippe as a cause of optic neuritis, 294.
 Gunshot injuries, x-ray photography in, 5.
 wounds of the kidney, primary nephrectomy for, 241.

H.

Hæmatemesis, a case of, 333.
 Hæmathidrosis, a series of cases of, 332.
 the etiology of, 337.
 the prognosis of, 340.
 the symptoms of, 335.
 the treatment of, 340.
 Hæmatokrit in the estimation of blood-disease, 10.
 Hæmoglobin, percentage of, in anaemia, 11.
 Hæmoptysis in aortic aneurism, 99.
 Hallucinations in paranoia, 174.

Halsted's operation for the cure of hernia, 44.
 Hearing, hallucinations of, in paranoia, 175.
 Heart, extreme dilatation of the, from valvular disease, 63.
 failure, the treatment of, 24.
 murmurs, the differentiation of, 145.
 Heat in the treatment of shock, 23.
 Hectic flush in lobar pneumonia, 141.
 Hemorrhage, cutaneous, 332.
 during circumcision, 223.
 from ovarian tumors, 276.
 in cancer of the uterus, 257.
 in naso-pharyngeal disease, 331.
 in tonsillotomy, 322.
 uterine, in hydatiform moles, 267.
 Hemorrhagic pancreatitis, 106.
 Hemorrhoids, the characteristic pain of, 218.
 Hepatization of the lung in pneumonia, 129.
 Hernia, a series of cases of, 46.
 double, a case of, 45.
 femoral, 225.
 irreducible, 196.
 the coverings of, 226.
 the surgical treatment of, 43.
 ventral, following coeliotomy, 121.
 Herniotomy, advantages of the modern methods of performing, 44.
 the history of, 43.
 the statistics of, 44.
 Herpes zoster, the symptoms of, 74.
 Holtz machines in x-ray photography, 3.
 Horn-like noise in aneurism, 100.
 Hot douches in salpingitis, 287.
 water for the relief of itching in eczema, 78.
 Hydatiform moles, 264.
 the diagnosis of, 266.
 the symptoms of, 266.
 the treatment of, 268.
 Hydrocele of the cord, cystic, a case of, 48.
 the treatment of, 46.
 Hydrochloric acid in solutions of quinine to aid their absorption, 14.
 Hydrogen peroxide in the treatment of cancer of the uterus, 263.
 Hydronephrosis, 192.
 Hydro-pneumothorax, a case of, 114.
 Hydrothorax, the etiology of, 140.
 the physical signs of, 139.
 the treatment of, 140.
 Hyperæmia, cutaneous, 340.
 Hyperæsthesia in hæmathidrosis, 335.
 Hypermetropia, the symptoms of, 156.
 Hyperpyrexia in lateral sinus thrombosis, 307.
 in pneumonia, 125.
 Hypersecretion of liquor amnii, 268.
 Hypertonicity in brain disorder, 158.
 Hypodermic injections of mercury in syphilis, 239.
 Hypoglossal nerve, distribution of the, 156.
 Hysteria associated with hæmathidrosis, 333.
 Hysterorrhaphy in retrodisplacement, 86.

I.

Ice in the treatment of hernia, 198.
 of naso-pharyngeal disease, 331.
 Ichthyol in the treatment of eczema, 79.

Impetigo contagiosa, the symptoms of, 74.
 Incoordination without spontaneous movements in brain disorder, 157.
 Indications demanding operation in appendicitis, 95.
 Infants, brain disorders of, 159.
 Infiltration of the cervix in cancer of the uterus, 254.
 Inguinal hernia, strangulated, a case of, 200.
 Injection, intravesical, in urethritis, 221.
 Intelligence in brain disorder, 158.
 Intercostal spaces, obliteration of, in pleural effusion, 136.
 Intermittent fever, a cause of aneurism, 101.
 pneumonia, 128.
 Intestinal occlusion in a case of torsion of an ovarian pedicle, 278.
 Intestine, foreign body located in, 5.
 Intra-abdominal treatment of uterine displacement, 86.
 Iodide of iron, syrup of the, in anæmia, 321.
 of potassium in the treatment of angina pectoris, 105.
 in the treatment of aortic aneurism, 50.
 in the treatment of syphilis, 238.
 reduction of blood-pressure by, in aortic aneurism, 51.
 Iodine in salpingitis, 287.
 Iodoform in antiseptic dressings, 223.
 in vaginitis, 289.
 Iritis in trifacial disease, 155.
 Iron in cardiac disease, 145.
 in the treatment of malaria, 13.
 syrup of the iodide of, in anæmia, 321.
 Irreducible hernia, the symptoms of, 201.
 Irrigation of the urethra in urethritis, 59.

J.

Joint-disease in its relation to cord-disease, 161.
 Juniper as a renal stimulant, 120.

K.

Kangaroo tendon as a suture, 44, 227.
 Kidney, fibro-cystic tumor of the, 193.
 topographical relations of the, 246.
 wounds of the, two cases of primary nephrectomy for, 240.
 Knee-joint, tabetic arthropathy of, 166.
 Knife-blades, the diagnosis of the position of, by x-rays, 5.

L.

Labor, the mechanism of, in its relation to torsion of ovarian tumors, 272.
 Lacerations of the cervix uteri a cause of cancer, 253.
 Lafayette's mixture in gonorrhœa, 58.
 Lancinating pain in angina pectoris, 103.
 Landmarks, topographical, 135.
 Lanolin in eczema, 77.
 Laparotomy for ovarian tumors, the statistics of, 273.
 Laryngeal spasm in aortic aneurism, 99.
 Laryngismus stridulus in brain disorder, 156.

Lateral deviation of the spinal column associated with arthropathy of the wrist, 170.
 sinus thrombosis following middle-ear disease, 315.
 in chronic otitis media, 307.
 Laveran's corpuscles in malaria, 18.
 Laxatives, the use of, in constipation, 214.
 Lead-poisoning as a cause of optic neuritis, 298.
 Leeches in the treatment of optic neuritis, 298.
 Leucocythæmia as a cause of optic neuritis, 294.
 Leyden jars in x-ray photography, 3.
 Lichen planus, the symptoms of, 74.
 Light, refractions of, in brain disorder, 156.
 Liquor amnii, hypersecretion of, 268.
 Lithæmia, the gastro-hepatic symptoms of, 15.
 Lobar pneumonia, a case of, 140.
 the physical signs of, 140.
 the treatment of, 140.
 Locomotor ataxia, arthropathies in, 160.
 Lotio nigra in eczema, 76.
 Lung, abscess of the, in pneumonia, 132.
 gangrene of the, in pneumonia, 132.
 Lupus, five cases of, 341.
 the dietetic treatment of, 345.
 the prognosis of, 345.
 the treatment of, 345.
 Lupus vulgaris, 74.
 Lymphoid tissue in naso-pharyngeal disease, 326.

M.

Macewen's method for the treatment of aneurism, 55.
 operation for the cure of hernia, 43.
 Maggots, the presence of, in a case of gangrene, 212.
 Magnesium in x-ray photography, 2.
 Malaria, double tertian type of, 11.
 the non-medicinal treatment of, 9.
 the treatment of, 8.
 Malarial plasmodium in Philadelphia, 8.
 in Rome, 9.
 Massage in the treatment of uterine displacement, 84.
 Mastoid disease following suppuration of the middle ear, 330.
 suppuration in chronic otitis media, 306.
 McBurney's operation for the cure of hernia, 43.
 point in appendicular colic, 215.
 Measles, a case of, 127.
 as a cause of optic neuritis, 294.
 Mechanical effects of uterine displacement, 82.
 Membrana tympani, retraction of the, in middle-ear disease, 330.
 Meningitis, a cause of optic neuritis, 294.
 diagnosis of, 155.
 purulent, from middle-ear disease, 313.
 septic, in chronic otitis media, 307.
 Mental tests in brain disorder, 159.
 Mercury, hypodermic injections of, in syphilis, 239.
 in neuritis, 299.
 inunctions of, in syphilis, 238.
 oleate of, in the treatment of lupus, 345.

Metacarpal bone, bullet embedded in, 5.
 Middle-ear disease in its relation to naso-pharyngeal adenoid vegetations, 326.
 two cases of, 306.
 Milk in the treatment of aneurism, 101.
 Mitral regurgitant murmur, 148.
 stenosis, a case of, 32.
 the symptoms of, 66.
 valve, insufficiency of the, 150.
 Mole, hydatiform, 264.
 Morphine in aortic aneurism, 52.
 in collapse, 26.
 in the treatment of pneumonia, 130.
 Mortality of operations for hernia, 45.
 Motor cranial nerves, affections of the, 155.
 Mouth-breathing in adenoid growths of the naso-pharynx, 318.
 Movements, spontaneous, in children, 154.
 Mucous patches in syphilis, 235.
 Murmurs, cardiac, the differentiation of, 145, 147.
 systolic, in ovarian tumors, 280.
 Muscles supplied by the cranial nerves, 156.
 Muscular exercise followed by hæmorrhoids, a case of, 337.
 sense, estimate of, in brain disorder, 159.
 Myoma of the uterus, a case of, 273.

N.

Naso-pharyngeal adenoid growths, 318.
 Naso-pharynx, anatomy of the, 328.
 Nauheim waters in the treatment of cardiac disease, 69.
 Neat's-foot oil in the treatment of eczema, 77.
 Necrosis of the head of the femur following fracture, 229.
 Needles, diagnosing the presence of, 5.
 Nephrectomy, abdominal incision in, 193.
 for calculous pyelitis, 193.
 primary, in wounds of the kidney, 240.
 the technique of, 243.
 Nerves, the presence of, in the pedicles of ovarian tumors, 274.
 Neuritis, optic, 290.
 retrobulbar, 295.
 traumatic, in children, 155.
 Nicotine as a cause of optic neuritis, 298.
 Nitrate of silver in urethritis, 60, 221.
 in vaginitis, 289.
 Nitrite of amyl in angina pectoris, 24.
 of sodium in aortic aneurism, 52.
 Nitrites, the range of usefulness of, 25.
 Nitro-glycerin in aortic aneurism, 52.
 in the treatment of collapse, 24.
 Nitrous ether in aortic aneurism, 52.
 Nose, lupus of the, 343.
 Nutrient enemata, the preparation of, 93.
 Nystagmus in brain disorder, 156.

O.

Occupation a cause of eczema, 75.
 Odor, gangrenous, of fluid from ovarian cyst, 283.
 Oedema, cerebral, following compression of the inferior vena cava, 100.
 in cardiac disease, 121.
 in ovarian cyst, 282.

Oedema of the mastoid process in chronic otitis media, 306.
 Oil of sandalwood in the treatment of gonorrhoea, 58.
 of sweet almonds in eczema, 77.
 Olive oil in the treatment of eczema, 77.
 Omental hernia, a case of, 47, 196.
 Omentum, cystic condition of the, in hernia, 199.
 Operative interference for peritonitis, 92.
 treatment of uterine displacement, 85.
 Ophthalmoscopic examination in brain disorder, 158.
 Opium in the treatment of peritonitis, 90, 92.
 of perityphlitis, 122.
 of urethritis, 221.
 Optic neuritis, 290.
 alcohol as a cause of, 298.
 anæmia as a cause of, 294.
 atrophy of the optic nerve in, 296.
 carbon bisulphide as a cause of, 298.
 convergent strabismus in, 290.
 diabetes as a cause of, 294.
 in abscess of the brain, 294.
 in brain tumor, 293.
 in Bright's disease, 294.
 in la grippe, 294.
 in measles, 294.
 in meningitis, 294.
 in scarlatina, 294.
 in syphilis, 294.
 in the exanthemata, 294.
 in typhoid fever, 294.
 leucocythæmia as a cause of, 294.
 nicotine as a cause of, 298.
 physical exertion as a cause of, 297.
 quinine as a cause of, 298.
 salicylic acid as a cause of, 298.
 the treatment of, 298.
 diaphoretics in, 298.
 leeches in, 298.
 mercury in, 299.
 potassium iodide in, 299.
 tobacco, the excessive use of, as a cause of, 298.
 Otitis media in its relation to naso-pharyngeal disease, 321.
 the symptoms of, 306.
 the treatment of, 317.
 Ovarian cyst with twisted pedicle, 287.
 Ovaries, blood-supply of, 274.
 Ovariectomy, pain following, 287.
 Ovary, prolapse of the, 288.
 Oxide of zinc ointment in eczema, 77.

P.

Pain as an index for the strength of urethral injections, 60.
 in aneurism relieved by iodide of potassium, 51.
 in pneumonia, 130.
 Pains, fulgurant, in locomotor ataxia, 161.
 Palpation of the normal ovaries, 288.
 Pancreatitis, hemorrhagic, 106.
 mortality of, 111.
 post-mortem appearances of, 108, 109.

Pancreatitis, the diagnosis of, 106.
the etiology of, 112.
the symptoms of, 106.
the treatment of, 106.
Papular syphilides, a case of, 234.
Paquelin cautery as a hæmostat, 233.
Paralysis of the vocal cords in aneurism of the aortic arch, 100.
Paranoia, 174.
the symptoms of, 180.
the treatment of, 184.
Parasites in malaria, 9.
Paroxysms of malaria, 9.
Pathology of hydatiform moles, 265.
Pearls of quinine muriate, 18.
Pedicle of hydatiform moles, 264.
torsion of the, in ovarian tumors, 270.
Pelvic cellulitis a cause of uterine displacement, 82.
Pelvis, growth of tumors within, 271.
Percussion in hydrothorax, 139.
in lobar pneumonia, 141.
Peritonitis, acute, after rupture ovarian cyst, 278.
acute, general, 89.
from appendicitis, 219, 250.
general, in women, 89.
indications justifying operative interference in, 92.
localized, 216.
the etiology of, 91.
Perityphlitis, a case of, 122.
the course of, 214.
Permanganate of potash in the treatment of gangrene, 206.
Pernicious anæmia as a cause of optic neuritis, 294.
Pessary in the treatment of uterine displacement, 85.
Physical exertion as a cause of optic neuritis, 297.
signs, normal, the importance of, 185.
Pigmented bodies in malaria, 11.
Platinum plate in x-ray photography, 2.
Pleurisy as a complication of pneumonia, 132.
Pleuritic effusion, 134.
Pneumogastric nerve, irritation of the, in brain disorder, 156.
Pneumonia, atypical cases of, 133.
croupous, variation in the clinical course of, 124.
hyperpyrexia in, 125.
the diagnosis of, 129.
the physical signs of, 129.
the symptoms of, 129.
Polypi in middle-ear disease, 330.
Portal-vein thrombi, a case of, 122, 123.
Posterior rhinoscopy in naso-pharyngeal disease, 320.
Potassium iodide in the treatment of optic neuritis, 299.
permanganate in the treatment of gangrene, 206.
of urethritis, 59.
Pregnancy during lactation, 289.
following operation for retrodisplacement of the uterus, 87.
mistaken signs of, 266.
Pressure symptoms in aneurism, *vv.*
Pruritus in hæmathidrosis, 335.
Pseudo-crisis of labor pneumonia, 143.

Ptoeis in brain-disease, 155.
Pulmonary artery, obstruction of the, 148.
Pulsation of aortic aneurism, 99.
Pulse, intermittence of, in brain disorder, 156.
variations of the, in brain disorder, 158.
Pupil, reactions of, in brain disorder, 156.
Puncture, exploratory, in ovarian cyst, 282.
Purge, the uses of, in hernia, 204.
Purpura hæmorrhagica in its relation to hæmathidrosis, 339.
Pyelitis, calculous, 191.
Pyelonephritis from a renal calculus, 194.
Pyrexia, effect of, on serous effusions, 119.
Pyrogallic acid in the treatment of lupus, 347.

Q.

Quinine as a cause of optic neuritis, 298.
bimuriate in whooping-cough, 20.
in whooping-cough, 17.
sulphate of, in malaria, 10.
the prophylactic dose of, 15.

R.

Radical cure of hernia, 43.
femoral, 228.
Rectum, abscess of the, following appendicitis, 94.
Red blood-corpuscles, proportion of, in anæmia, 10.
Refraction, errors of, in brain disorder, 158.
Regurgitant murmur, the diagnosis of, 147.
Renal artery, rupture of the, in gunshot wound of the kidney, 244.
Resisted movements in the treatment of cardiac disease, 69.
Resolution in pneumonia, 128.
Resorcin in the treatment of eczema, 79.
Respiration, abdominal type of, in cardiac disease, 38.
Rest in bed in the treatment of cardiac disease, 31.
in the treatment of aortic aneurism, 50.
of cardiac affections, 31, 69.
Retrobulbar neuritis, 296.
the etiology of, 297.
Retrodisplacements of the uterus, 81.
the treatment of, 81.
varieties of, 81.
Rheumatism, a cause of neuritis in childhood, 155.
mistaken for spinal arthropathy, 161.
Rhinoscopic mirror in naso-pharyngeal examinations, 327.
Rhinoscopy, posterior, 320.
Röntgen's discovery, the diagnostic value of, 1.
Rose ointment in eczema, 77.
Rötheln, a case of, 127.
Round ligaments, shortening of the, in retrodisplacements of the uterus, 85.
Rubella, a case of, 126.
Rusty-colored sputum in pneumonia, 124.

S.

Sac, hernial, contents of the, 202.
the treatment of the, 198.
Salicylic acid as a cause of optic neuritis, 298.

- Salicylic acid in the treatment of eczema, 79.
 Saline baths in the treatment of cardiac disease, 35, 69.
 Salol in the treatment of eczema, 80.
 of gonorrhœa, 58.
 Salpingitis as a cause of sterility, 286.
 Salt solution, normal, for sterilizing instruments, 231.
 Sandal-wood oil in urethritis, 221.
 Scarlatina as a cause of optic neuritis, 294.
 the prophylaxis of, 322.
 Schott's method of treatment of cardiac affections, 34, 63.
 Schucking's method of treating retrodisplacements of the uterus, 85.
 Schültze's method of treating retrodisplacements of the uterus, 85.
 Sclerosis, disseminated, the characteristics of, 158.
 Scoliosis, a symptom of syringomyelia, 169.
 Seeds, a cause of appendicitis, 217.
 Sensibility, cutaneous, importance of, in brain disorder, 158.
 Septic meningitis in chronic otitis media, 307.
 Sequels of trachoma, 303.
 Sex, the influence of, in hæmorrhoids, 337.
 Shadows, importance of, in x-ray photography, 2.
 Shot, localising of, by x-ray photography, 5.
 Silk sutures in herniotomy, 44.
 Silver nitrate in gonorrhœa, 60.
 Skiagraph, the method of taking, 2.
 Skiascope of Magie, 4.
 Snare, cold wire, in the treatment of aural polypi, 330.
 Sodium chloride solution for sterilizing instruments, 231.
 iodide in the treatment of aneurism, 101.
 Sounds, cardiac, the diagnosis of, 152.
 Spasms in brain disorder, 158.
 in septic meningitis, 307.
 Specific gravity in the relation to the penetrability of the x-rays, 6.
 Speech in brain disorder, 158.
 Sphincter ani, distention of, in restoring suspended animation, 209.
 Spinal accessory nerve, irritation of the, in brain disorder, 156.
 Spirality of growth in the development of organisms, 271.
 Spirits of nitre in renal stimulation, 120.
 Spontaneity, the absence of, in brain disorder, 158.
 Spontaneous action, excess of, in brain disorder, 157.
 relief of ascites, 118.
 Sputum, the characteristic, of pneumonia, 124.
 Squill, tincture of, in renal stimulation, 120.
 Stammering in brain disorder, 158.
 Starch poultice in the treatment of eczema, 76.
 Statistics of uterine cancer, 261.
 Statuesque children, 158.
 Steam sterilizer in surgical technique, 231.
 Stenosis of the os uteri in sterility, 287.
 Sterility from peri-ophor-salpingitis, 286.
 Stigmata, bloody, 334.
 Storage-cells in x-ray photography, 3.
 Strabismus, convergent, in optic neuritis, 290.
 Strangulated hernia, a series of cases of, 45.
 inguinal hernia, a case of, 200.
 Streptococcus pneumoniae, 130.
 Strumous cachexia, 321.
 Strychnine in cardiac disease, 321, 145.
 in the treatment of collapse, 90.
 Subcutaneous injection of quinine in whooping-cough, 20.
 Sulphate of copper in gonorrhœa, 60.
 of zinc in gonorrhœa, 60.
 Sulphocarbolate of zinc in gonorrhœa, 60.
 Sulphur and zinc crystals, fluorescence from, 2.
 baths in eczema, 76.
 Suppuration, intracranial, from middle-ear disease, 330.
 of the middle ear, consequences of, 330.
 Suprarenal glands, the extract of, in the treatment of collapse, 25.
 Surgical technique, 230.
 Suture material for herniotomy, 44.
 Sutures, the preparation of, for operation, 231.
 Swelling, brawny, in arthropathy, 163.
 Sycoosis, the symptoms of, 75.
 Syphilis as a cause of aortic aneurism, 52.
 of multiple aneurisms, 101.
 of optic neuritis, 294.
 Colles's law in, 185.
 five cases of secondary, 234.
 in aortic aneurism, 52.
 the diagnosis of, 343.
 Syrup of the iodide of iron in anæmia, 321.

T.

- Tabes dorsalis, trophic lesions of, 160.
 Tannate of quinine in whooping-cough, 19.
 Tannic acid in tonsillitis, 323.
 Tannin in vaginitis, 289.
 Tar preparations in the treatment of eczema, 79.
 Tegmen tympani, the relative position of, 315.
 Temperature, extreme, in pneumonia, 126.
 in malaria, 14.
 record in a case of lobar pneumonia, 144.
 Temporal bone, the anatomy of, 315.
 Tesla disruptive coil, 3.
 The elixir of buchu and potassium acetate in the treatment of gonorrhœa, 58.
 The palliative treatment of cancer of the uterus, 263.
 The Schott treatment of valvular disease of the heart, 34, 63.
 Thiersch's solution in urethritis, 221.
 Thrombosis of the lateral sinus in middle-ear disease, 307, 313.
 of the portal vein, a case of, 122.
 Thymol in the treatment of eczema, 78.
 Tight lacing a cause of uterine displacement, 82.
 Tobacco, the excessive use of, a cause of optic neuritis, 298.
 Tonics in the treatment of lupus, 345.
 Tonsil of Luschka, 318.
 Tonsillitis, chronic follicular, the treatment of, 321, 324.
 cocaine in, 324.
 cod-liver oil in, 325.
 gallic acid in, 323.
 syrup of the iodide of iron in, 325.
 tannic acid in, 323.
 tonsillitome in, 321.
 Tonsillitome, the use of, 321.

Tonsils, enlarged, indications for the removal of, 321.
 Tooth-grinding in brain-disease, 155.
 Topographical landmarks, 135.
 Torsion of the pedicle in ovarian tumors, 270.
 Trachoma, four cases of, 300.
 the pathology of, 300.
 the treatment of, 301.
 boracic acid in, 301.
 cocaine in, 301.
 Trachoma-forceps for expressing follicles, 305.
 Transfixion with pins in the treatment of aneurism, 56.
 Traumatic causes of uterine displacement, 82.
 Treatment of aneurism of the aorta, 49, 101.
 iodide of potassium in, 101.
 regulated diet in, 101.
 of angina pectoris, 24, 105.
 dietetic regulation in, 105.
 potassium iodide in, 105.
 of appendicitis in children, 250.
 of ascites, 121.
 of calculous pyelitis, 194.
 of cancer of the uterus, 260.
 of cardiac affections, 31, 145.
 of cardiac failure, 34.
 of collapse, 24, 90.
 of oedema, 74, 77.
 corn-starch in, 76.
 fuller's earth in, 76.
 kaolin in, 76.
 lycopodium in, 76.
 rice flour in, 76.
 of enlarged tonsils, 322.
 of entropion, 304.
 of gonorrhoea, 57.
 of gunshot wounds of the kidney, 242.
 of hernia, 43.
 of hydatiform moles, 268.
 of hydrocele, 46.
 of irreducible hernia, 197, 204.
 of lupus, 348.
 of middle-ear disease, 317.
 of naso-pharyngeal disease, 330.
 of opium-poisoning, 24.
 of optic neuritis, 298.
 of otitis media, 312.
 of paranoia, 184.
 of peritonitis, 90, 93.
 of retrodisplacement of the uterus, 85.
 of salpingitis, 287.
 of syphilis, 237.
 of trachoma, 304.
 boracic acid in, 301.
 cocaine in, 301.
 sodium bichlorate in, 303.
 sulphate of zinc in, 303.
 of vaginitis, 289.
 of whooping-cough, 16.
 Triangle of Macewen, 316.
 Tricuspid insufficiency, the diagnosis of, 148.
 Trifacial nerve, the distribution of the, 156.
 Trophic lesions in locomotor ataxia, 160.
 Truss, after operation for hernia, 45, 197.
 Tubercle bacillus a cause of lupus, 342.
 Tubercular syphiloderm, the significance of, 344.
 ulceration, the diagnosis of, 216.

Tuberculosis, the diagnosis of, 6.
 Tufnell's treatment of aortic aneurism, 50.
 Tumors of the brain a cause of optic neuritis, 294.
 torsion of the pedicle in ovarian, 270.
 Twin pregnancies, the diagnosis of, 268.
 Tympanum, the topographical anatomy of, 314.
 Typhlitis, a case of, 214.
 Typhoid fever as a cause of aneurism, 101.
 as a cause of optic neuritis, 294.
 complicating appendicitis, 218.
 the symptoms of, 216.

U.

Ulcer, perforating, in tabes dorsalis, 173.
 rodent, 343.
 Ulceration of the cæcum, 216.
 tubercular, the diagnosis of, 216.
 Ulcers of the cervix, the danger of, 253.
 Uranium salts in x-ray photography, 2.
 Uranyl and potassium, sulphate of, in skiagraphy, 2.
 Urethra, anatomical division of the, 57.
 chronic posterior inflammation of, 221.
 Urethritis, chronic posterior, 220.
 irrigation of the urethra for, 59.
 Uridrosis, 338.
 Urine, test for anterior urethritis, 60.
 Uterine hemorrhage, a case of, 268.
 Uterus, ante flexion of the, 279.
 normal position of the, 81.
 retrodisplacement of the, 81.

V.

Vaginal hysterectomy, 87.
 Vaginitis, granular, a case of, 288.
 treatment of, 289.
 Valvular disease of the heart, a case of, 63.
 insufficiency in cardiac disease, 146.
 Ventral fixation of the uterus for displacement, 88.
 Vermiform appendix, inflammatory condition of, 89.
 Visual field in a case of optic neuritis, 291, 295.
 in retrobulbar neuritis, 297.
 Vocal fremitus, absence of, in pleural effusion, 139.
 Vomiting, persistent, in strangulated hernia, 201.

W.

Whooping-cough, the etiology of, 16.
 the parasite of, 21.
 the treatment of, with quinine, 16.

X.

X-ray photography, the uses of, 5.

Z.

Zinc, acetate of, in gonorrhoea, 60.
 and sulphur crystals, fluorescence from, 2.
 sulphate of, in gonorrhoea, 60.
 sulphocarbonate of, in gonorrhoea, 60.

E GAL 55 0

211A
COUNTWAY LIBRARY

HC 2EJY C

